



Silta whitepaper

Silta — The DeFi bridge to a sustainable future

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Executive summary

From the ocean depths to mountain tops, from melting glaciers to relentless extreme weather events, ecosystems and communities around the globe are being devastated¹.

— António Guterres, UN Secretary-General

For the sake of our planet, we need to change our ways, and we need to do it now. Infrastructure funding has to be steered towards projects for good and away from those that harm the environment. The time for responsible financing has come. The Silta DAO has the ability to provide access to that financing and change the world.

Making the world a better place requires large-scale investment in sufficient renewable power, clean water, and sustainable waste management. The innovators and investors are there. Governments want green infrastructure. The public wants a safer future. Such a utopia, though, is being held back by complex financing mechanisms which deny access to finance to small-scale and progressive projects aiming to build real assets for a sustainable future.

One popular way of financing real assets is *project finance*. It is a funding model where the capital (equity and debt) required to develop an infrastructure project is sourced from the private sector. The debt is repaid to lenders from the cash flows generated from the operations of the infrastructure asset. Project finance can be used to fund public infrastructure and services, in which case it is known as Public Private Partnership (PPP).

Project finance can bring several benefits for infrastructure investment. The public benefits from private capital, efficient allocation of risk, better service for the public, cash flow matching to long-term liabilities, private sector efficiency, and good value for money. In practice, though, infrastructure transactions are complex and costly. It may take anywhere from one to three years or more and several million dollars to put together a funding package and carry out the due diligence. Total transaction fees for project finance deals can run into millions of dollars before a single shovel hits the dirt.

Because of the complexity of the financing process and high transaction costs, project finance is ill suited to smaller projects valued from a few million to approximately 100 million US\$. If the current project finance practice could be simplified, standardized and streamlined, there would be a sizable business and investment opportunity and significant pent-up demand in many parts of the world. This simplification is what Silta seeks to provide. Silta is not a fund or an investment vehicle, and it will not invest people's money on their behalf. Instead, it is a solution which allows borrowers such as project companies to apply for funding for real assets in the decentralized finance world.

Silta consists of several key components: A transaction pipeline of funding applications by potential borrowers, a proprietary scoring methodology for due diligence, risk and sustainability (Silta score), smart-contract-based third-party loan pools, and a decentralized governance system (the Silta DAO).

In Silta, each project is assessed for risk. Project fundamentals and sustainability drivers are evaluated, quantified and benchmarked to similar projects. The aim is to determine the likelihood that

¹ "State of Climate in 2021: Extreme events and major impacts", 31th October 2021: <https://public.wmo.int/en/media/press-release/state-of-climate-2021-extreme-events-and-major-impacts>; a report by the World Meteorological Organization (WMO).

the infrastructure asset will be successfully completed and is able to generate adequate cash flows to cover the debt obligations. As part of the Silta score, each project is also evaluated on environmental, social and governance (ESG) criteria.

If a project successfully passes the rating stage and is approved by the Silta DAO, a loan pool is opened for contributions from lenders. Silta tokens from the DAO treasury are put up as the collateral. Investors wishing to participate in funding a project add liquidity to a loan pool in the form of stablecoins. In return, they receive loan pool tokens. When there are sufficient funds in the pool, the stablecoins are released to the borrower against the proper documentation.

The potential market for Silta is huge. Looking at just the PPP model, more than 6,400 infrastructure projects have been built globally in the last twenty years. The total value in these transactions is about US\$ 2.9 trillion, and the average deal size is US\$ 440 million. Nearly half of the deals have been in smaller infrastructure projects of less than US\$ 100 million.

The market is growing, and the investment spending on infrastructure is expected to increase along with population growth and urbanisation in Africa and Asia. There is also significant investment demand in Europe and the Americas, where the infrastructure is ageing and needs replacing and upgrading. The total projected infrastructure investment through 2040 is about US\$ 94 trillion, or almost US\$ 4 trillion per year.

Silta benefits project sponsors, developers, and lenders. Governments and public agencies gain access to an additional source of private sector funds. Borrowers enjoy significantly lower transaction costs and reduced complexity of the funding process. Lenders are given access to a relatively safe asset class which is currently not easily available for investment. Lenders also contribute to sustainable development and to the good of the society.

For DeFi lenders, Silta opens up a brand new class of investment opportunities. While many of the financial products in DeFi can be highly lucrative, they can also be extremely volatile and are typically not grounded in cash flow from real assets. By contrast, third-party loan pools in the Silta solution are more stable and expose the lenders to a lower level of risk with a preference for government guarantees. The loan pools are expected to yield a respectable return on capital with interest rates up to 15% or more per annum in specific products such as mezzanine loans.

The Silta token is an ERC-20 utility token on the Ethereum network, and it is the key to the solution. The use of Silta tokens as collateral makes Silta compatible with major third-party loan protocols, and gives borrowers access to \$250 billion plus of value already locked in DeFi. The token empowers the community: The Silta DAO decides on what kinds of infrastructure assets merit investment and which projects are eligible for funding.

The Silta journey started from a recognition that decentralized ledger technology can be used to make partnerships between the public and the private sector more efficient. However, we've come to understand that Silta can apply equally well to corporate finance and funding other kinds of private sector projects or into existing assets (brownfield projects). Examples will not be hard to find, and we welcome enquiries and specific suggestions on where Silta can be of service.

The Silta vision is to create a new line of credit for building real assets. The solution streamlines and standardizes the financing process and automates the risk analysis. Silta brings governments, international financial institutions and private sector borrowers a cheaper and simpler source of funding, and opens a new and global investment opportunity for lenders. Silta is well suited for assets with investment needs starting at a few million US dollars, but it extends to projects worth billions.

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List of acronyms

Acronym	Definition
ADB	The Asian Development Bank
AML	Anti Money Laundering
AMM	Automated Market Maker
API	Application Programming Interface
APY	Annual Percentage Yield
CeFi	Centralized Finance
COD	Commercial Operations Date
CPMM	Constant Product Market Maker
DAO	Decentralized Autonomous Organization
dApp	Decentralized Application
DCSR	Debt-Service Coverage Ratio
DeFi	Decentralized Finance
DEX	Decentralized Exchange
EBRD	The European Bank for Reconstruction and Development
EPC	Engineering Procurement and Construction
ESG	Environmental, Social, and Governance
ETH	Ether (a cryptocurrency)
GCC	Gulf Cooperation Council
IFI	International Financial Institution
IRR	Internal Rate of Return
KYC	Know Your Customer
LLCR	Loan Life Coverage Ratio
LP	Liquidity Pool / Loan Pool
O&M	Operations & Maintenance
PPP	Public Private Partnership
SDG	Sustainable Development Goal
SPV	Special Purpose Vehicle

1. Introduction

Significant funds are invested every year in building and upgrading physical infrastructure. The total investment need globally in the next two decades is estimated to be in the region of US\$ 3.9 trillion per year, with much of the spending taking place in newly industrialised and developing countries². This investment is needed for power generation, telecommunications, transport, water and sanitation systems, and many other purposes.

Infrastructure consists of physical assets, structures and systems that support the functionality of a country, city, or other area. In broad terms, it includes the services and facilities which are necessary for the economy to function. Infrastructure can also be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions" and maintain the surrounding environment³.

Parts of the infrastructure are publicly owned and maintained, and other parts are in private hands. There are many kinds of physical infrastructure such as highways, railways, bridges, tunnels, water and sanitation plants and sewers, power plants, transmission grids, telecommunications facilities, Internet connectivity and means of broadband access.

Funding for building and maintaining infrastructure comes from various public and private sources. Project finance is a funding model where the cash flows from the operation of the infrastructure are used to pay back the debt needed for the construction and the development of an asset. The security for the debt consists of the underlying fundamentals of the project rather than corporate guarantees or assets.

Project finance is often used to fund public infrastructure, and it is a key component of a procurement and delivery model known as Public Private Partnerships (PPP). This is a cooperative arrangement where the government sets forth the project requirements and evaluates competing private sector bids. Private sector partners source the capital and put together the professional expertise and resources needed to build and operate the asset.

Given the complexity of project finance, the bidding process and the due diligence can be extremely time consuming and costly. It may take anywhere from one to four years and cost several million dollars for the government to assess, structure and procure a private sector partner. In the private sector, project companies and lenders incur costs for legal, technical and financial advisory services and for the requisite due diligence process. It is not uncommon for the total advisory fees to run into tens of millions of dollars.

Due to high transaction costs, the project finance model does not lend itself well to smaller projects. Simplifying the procurement and funding process would open up a significant business and investment opportunity in projects valued from a few million to approximately 100 million US dollars. There is pent-up demand for such smaller projects in many parts of the world, and feasibility studies have been conducted in e.g. the UK, Netherlands, Vietnam and the U.A.E.

This whitepaper presents a solution which meets the opportunity. Silta dApp allows borrowers to apply for debt financing for building infrastructure assets in a streamlined and efficient manner. Projects approved by the Silta DAO are given access to a tokenized pool of capital, and contributors

² European International Contractors, Global Infrastructure Outlook to 2040, 17 Nov. 2017: <https://www.eic-federation.eu/industry/global-infrastructure-outlook-2040>.

³ Fulmer, Jeffrey (2009). "What in the world is infrastructure?". PEI Infrastructure Investor (July/August).

to loan pools receive a respectable rate of interest. Silta is the bridge which connects decentralized finance with real assets.

The driving force behind Silta is the recognized need for a better way to do project finance. The founding team has worked on over 50 project finance transactions worth more than US\$ 44.5 billion in total in their careers. The founders have experience from the U.S. and Europe to the Gulf region and the Far East in a multitude of sectors, including road, rail, power, and ports to renewables and utilities. They have first-hand knowledge of the challenges faced by governments and project companies, and have long been frustrated with the limitations of the current financing model. Combining the industry knowledge with the new possibilities in blockchain technology makes it possible to untangle the knots in the infrastructure funding process.

The rest of this whitepaper is organised as follows:

- Section 2 discusses the existing funding models in infrastructure development.
- Section 3 focuses on the newly emerging field of decentralized finance.
- Section 4 summarizes the opportunity for project sponsors, developers and lenders, and quantifies the potential market size.
- Section 5 describes the solution in more detail, including the high-level architecture, the rating methodology, and the mechanics of loan pools.
- Section 6 contains the implementation roadmap.
- Section 7 explores future opportunities.
- Section 8 introduces the founding team.

2. Infrastructure financing

There are many different ways to finance infrastructure investments. In the case of public infrastructure projects, funding may be earmarked in the government budget. Public entities (a federal government, a local government or a municipality) can issue bonds in order to finance the construction of infrastructure assets. Such bonds may be sponsored by a government agency or an international financial institution, e.g. the World Bank or the Asian Development Bank.

Infrastructure can also be financed in capital markets. Companies that are in the business of building and operating infrastructure assets can issue equity or corporate bonds, or borrow funds from commercial banks. In larger projects, bank loans are often syndicated to share the risk. Capital can be pooled via listed infrastructure funds or ETFs.

Project finance

Project finance is a funding model where the cash flows from the operation of a physical asset are used to pay back the debt needed to finance its construction. When project finance is used to fund public infrastructure, it is called Public Private Partnership (PPP). While this funding model is popular in many less developed countries where the public funding is scarce, PPP financing is well known and utilized in developed countries too.

There is a wide variety of financial and contractual relationships in project finance. In most cases, a standalone economic unit (a Special Purpose Vehicle or SPV) is set up for each project. The project company shareholders contribute equity, but most of the funding is typically raised as debt.

In PPP, the government or other public entity initiates the infrastructure project and invites bids from the private sector. Interested companies form a consortium and finance the project with a combination of debt and equity issued by an SPV. The government evaluates the competing bids and awards the work to one of the consortia in the running.

The use of private finance in funding infrastructure brings significant advantages to the procuring government and other public sector entities in the process. From the public viewpoint, project finance provides for certainty in the cost of the delivered infrastructure asset, access to private sector innovation and efficiency, the ability to better manage government budget, cash flows from long term assets matched to the repayment profile, value for money for the public purse, and the ability to use performance-based payment mechanisms. For private sector lenders, the PPP model offers a relatively safe investment opportunity. For project companies, the construction and operation of public sector assets is a business opportunity.

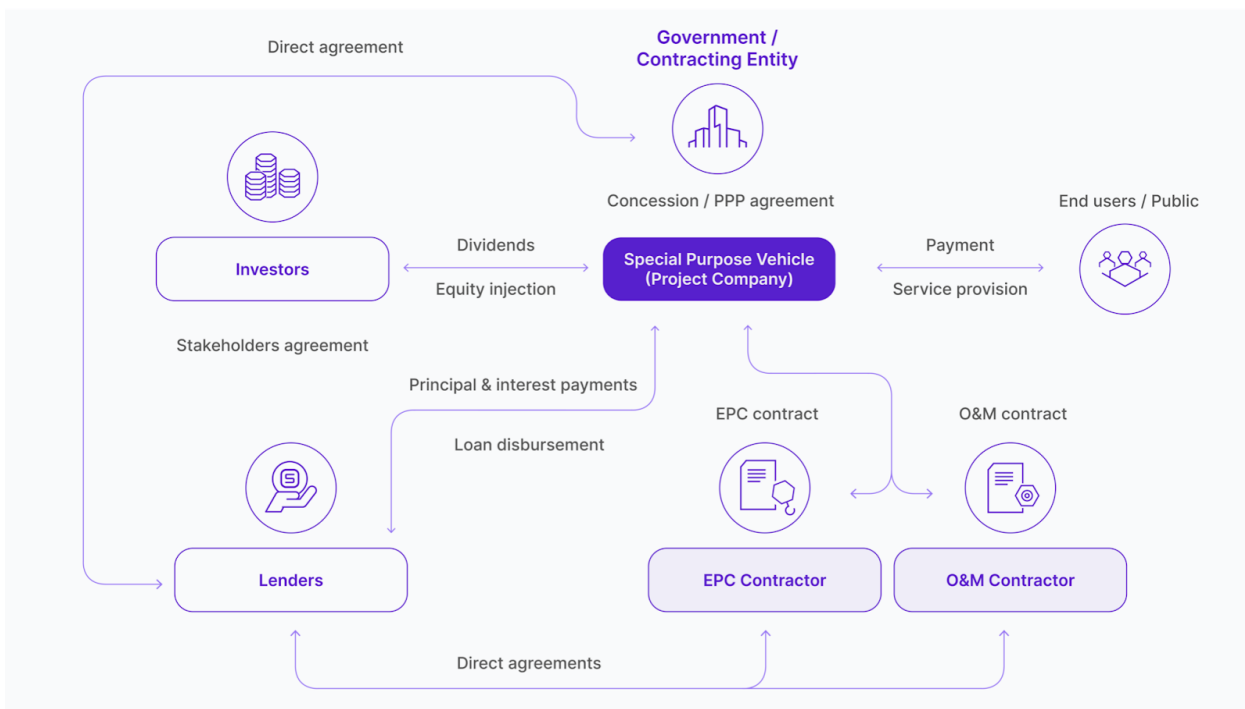


Figure 1. A typical project finance structure in infrastructure development.

Figure 1 shows a typical structure in project finance.

- A project company (an SPV) is formed by industry partners for the sole purpose of delivering the project. The shareholders inject equity into the project company, and the rest of the required funds are raised as debt from lenders.
- The project company enters into a long term concession agreement (the PPP contract) with a creditworthy counterparty such as a government or a public authority. The concession agreement sets out the key terms and conditions under which the project company must operate, and it defines the revenue model.
- The project company subcontracts the design and build of the asset to an engineering, procurement and construction (EPC) contractor. An operations and maintenance (O&M) contractor assumes responsibility during the operation of the asset. Both EPC and O&M contractors provide guarantees for their obligations.

Project finance example

As an example of how the project finance model works in practice, imagine that the Government of Dubai needs to build a new toll road and wishes to explore a PPP model and private sector financing for the project. In such a case, the government would issue a tender request. The tender includes specifics such as the desired location for the road, its required capacity, the anticipated investment value, and other pieces of key information.

The government would make a detailed feasibility study available to prospective bidders, thus allowing them to gain a deeper understanding of the project and its feasibility. Various private sector firms would form consortiums, take part in a competitive bidding process and present their case to the government. The procurement process will take months as the government evaluates the competing bids and negotiates with the consortia. In the end, the government selects one winning bid.

Once the project has been awarded to a project company, the consortium needs to secure the necessary funds to finance the project. Projects are typically funded with a combination of debt and equity, with debt representing a lower risk profile than equity. Equity (say 25% of the total) is provided by the shareholders in the project company SPV, and debt from commercial banks or multilateral agencies forms the balance of funds. The investors' return expectations and the interest rate on the loan depends on the type of project, the geographical location and various risk factors.

The banks or other entities funding infrastructure projects will commission a thorough due diligence study before granting a loan to the consortium. Due diligence is carried out by a team of financial, technical and legal advisors and other professionals. The process is costly and takes work and expertise. Given the large sums of money involved, the time spent and the expenditure are accepted parts of the model.

With financing approved, the consortium starts the construction of the infrastructure asset. If all goes well, the road is completed in a few years. Once the toll road is opened to the public, the operational phase starts and the drivers are charged a tariff at toll booths. The project company collects fees and uses the proceeds to pay back the debt with interest (with possibly several tranches of seniority) to the lending consortium. Equity holders receive annual dividends as a return on their investment. When the concession period ends, the government takes over the operation of the road.

Infrastructure projects range in size from millions to several billions of US dollars. As to the timeline, asset construction can take from two to four years depending on the size and complexity of the asset or facility in question. A testing and commissioning phase follows to make sure that the asset is built to specifications and meets the performance requirements. The project then moves to the operational period. This may last 15-30 years, but can occasionally be as short as 2-5 years.

In a typical scenario, the project company operates and maintains the asset throughout the concession period and receives revenue through either end-user payments (tariffs) or direct government payments. After the concession period ends, the asset is handed over to the government or to the public entity which originally granted the concession.

A ratio of 20-30% equity and 70-80% debt is common but other splits are possible. Equity is provided by the investors or the companies which make up the consortium. Debt is usually provided on a limited or non-recourse basis by financial institutions. The lenders may include commercial banks, export credit agencies or multilateral or donor agencies (such as the World Bank, EBRD, or ADB).

The loan component can be further divided into senior debt and junior or subordinated debt. Different tranches come with different borrowing costs, depending on seniority, the risk profile and repayment terms. Repayment terms can vary significantly from project to project, ranging from 5 years up to 30 years. Structures such as hard and soft mini-perms⁴ have become common in some jurisdictions. Long-term debt is more difficult to secure than it was prior to the financial crisis in 2008.

The cost of debt

In project finance, the interest rate for debt is driven by the following factors (see Figure 2):

- The base rate (e.g. LIBOR or the interest rate for benchmark government bonds of the same maturity).
- The credit spread (the margin charged by the lender to the project, adjusted for various risk factors).
- The cost of hedging, if any (e.g. an interest rate swap, converting floating rate into a fixed rate which is usually a precondition of securing a project finance loan).
- Administration fees (agency fees, commitment fees etc).

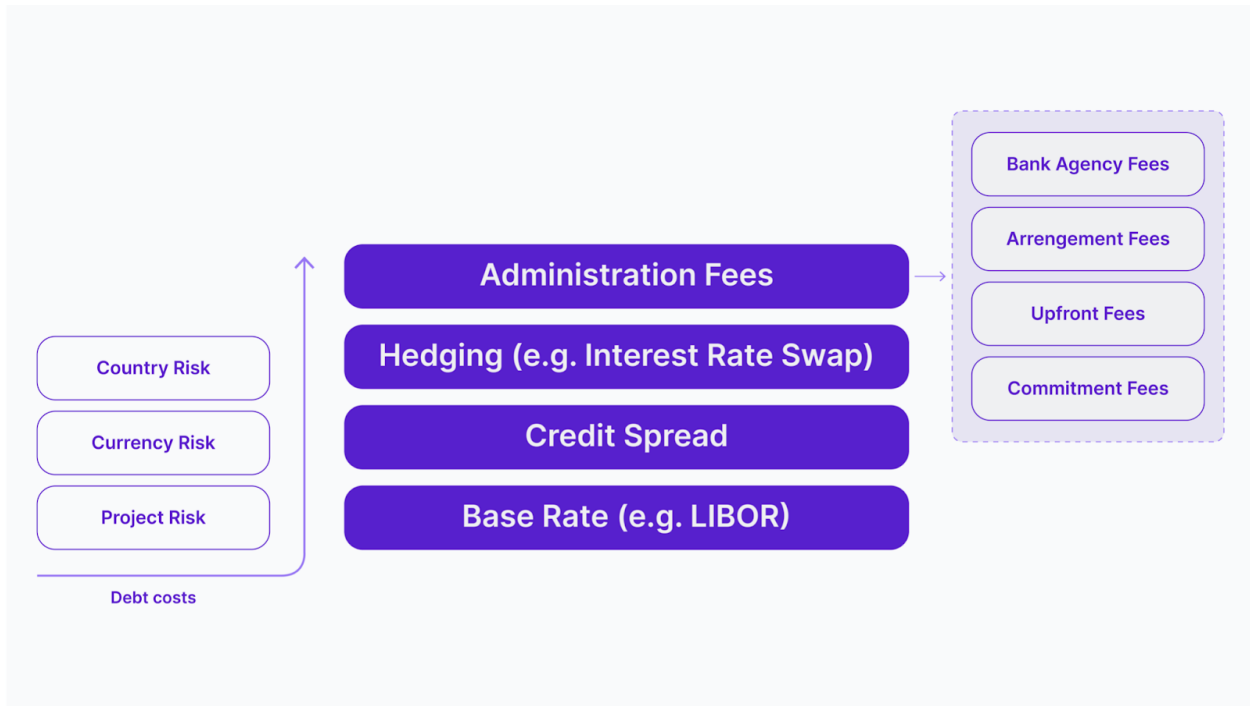


Figure 2. The interest rate elements in project finance loans.

Some interest rate factors are driven by macroeconomic conditions and the base rate, while other elements are influenced by project-specific factors. The latter include the credit spread, i.e. the lenders’ assessment of various risks such as the geography, offtaker credit, and the technology in use.

⁴ A ‘mini-perm’ structure is a form of debt finance alternative to traditional long-term fully amortising debt, whereby it is assumed and acknowledged that the debt will be refinanced during the term of the concession.

In practice, the 'all in' cost of debt in project finance varies significantly. The annualised cost of debt can be as low as 4-5% in some cases and as high as 20% in others. The price of debt depends on the country risk, counterparty risk, the revenue model (end-user vs. bulk offtake⁵ / government availability payment⁶), technology risk, project complexity, the availability and identity of sponsors, sub-contractors' risk profiles, etc.

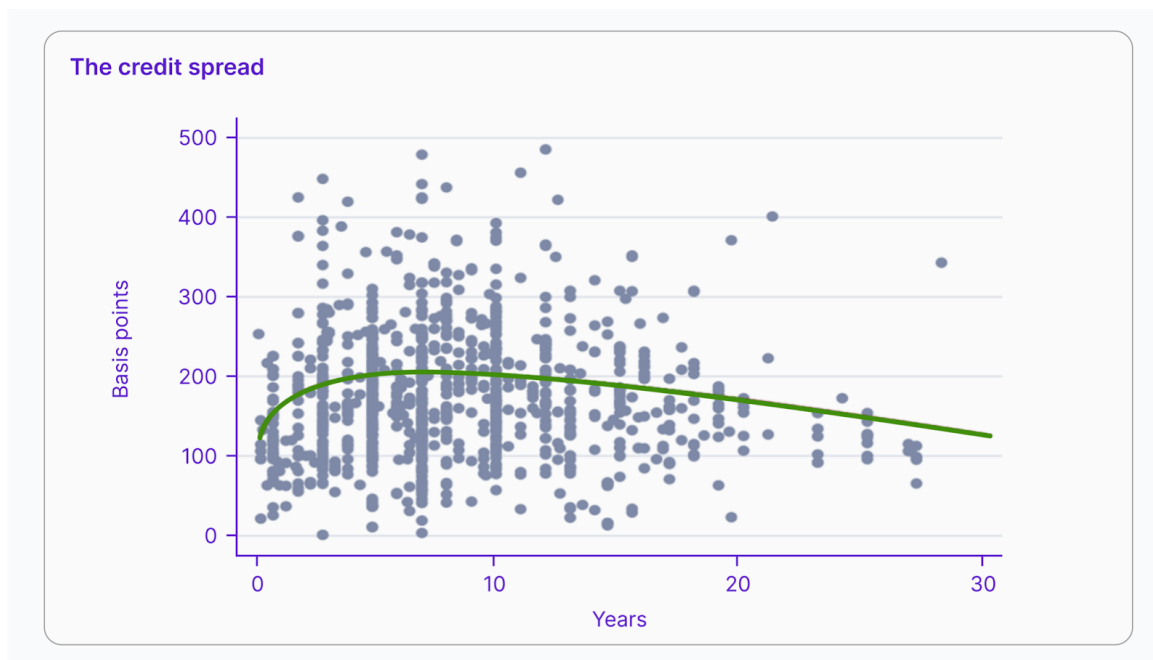


Figure 3. Credit spread for project finance loans of different maturities between 1993 and 2001⁷.

Figure 3 shows the credit spread for a large cross-section of international project finance loans between 1993 and 2001 in both industrialised and emerging countries as a function of the loan maturity. There is a wide range of credit spreads for individual loans, ranging from almost zero up to 400-500 basis points for certain loan maturities.

Credit events

Project finance debt is usually provided on a non-recourse (or 'limited' recourse) basis. What this means is that there is no recourse back to shareholders of the project company in the case of a credit event⁸, and the lenders can ultimately take over the concession.

This is a typical process in case a project runs into difficulties:

- If the project company performs poorly and fails to achieve loan covenants (e.g. it fails to maintain a minimum debt service cover ratio), the concession agreement imposes restrictions

⁵ The offtaker is a government utility or other entity which purchases the product (such as electricity produced by a power plant) under a built-to-operate (BOT) model. If there is no offtaker in the concession agreement, the operating company is allowed to sell the product (such as electricity) directly to consumers without a government intermediary

⁶ Instead of usage fees collected in the operational phase, this model involves the government paying the project company directly for the availability of the asset.

⁷ For source, see Marco Sorge and Blaise Gadanecz (2004): "The term structure of credit spreads in project finance", BIS Working Papers 159, Bank for International Settlements.

⁸ A credit event rises in case of an outright default, a missed or delayed interest payment, or some other substantial failure to comply with the loan terms.

on the project company. Restrictions may include dividend lock-up, acceleration of repayments, or cash sweeps in favour of the lenders.

- If the project company continues to fail the loan covenants, lenders are typically granted the right to step in and replace the project company (or more precisely, to replace its shareholders). Lenders can then either try to rectify the situation or put in place a suitable replacement in the form of new equity investors.
- As the last resort in a failing project, the contract for the project can be terminated. An early termination can be triggered by a serious breach of contract by the project company, by project company bankruptcy, or by a prolonged *force majeure* event. The contracting government authority may also be entitled to terminate the accord at its discretion.
- Should the project be terminated, substantial compensation is usually paid by the government to the project company. The amount of compensation varies depending on who is at fault. In standard practice, the compensation is sufficient to repay the senior lenders in full.

The challenges in project finance

Project finance can bring several benefits in better value for money to the public and better services to the users of the infrastructure. However, the practice does not always live up to the expectations, and projects get delayed for various reasons. Delays erode the public trust, lead to lower financial returns to investors, and reduce the cost savings. In our experience, the complexity of project financing is one of the key reasons for delays and other shortcomings in infrastructure projects.

To see why the reality often falls short of the ideal, let's have a look at the financing process in more detail. Most large-scale infrastructure projects seek non-recourse financing from international lender groups. Such groups consist of a lead arranger bank, a syndicate of other banks, offshore and onshore security agents, and insurers of country risk. Non-recourse financing is often the preferred choice due to the lender groups' ability to mobilize large amounts of capital (say US\$ 2 billion for a power project) with acceptable interest rates (perhaps 3% above LIBOR) and a long time to maturity (a typical repayment tenor is in the range of 10-15 years).

Figure 4 illustrates the project financing structure. Each lending party exerts its requirements on the borrower and the project, and the loan cannot be signed before all of these are satisfied. To start with, the developer must seek out and convince a lender (lead arranger) to finance the project. The lead arranger goes to market to find other lenders with interest in the project. Once a lender group is put together, it appoints a number of transaction advisors on financial, legal and technical issues. The advisors carry out a due diligence process and draft and negotiate the loan documents. The cost for this process is borne by the borrower.

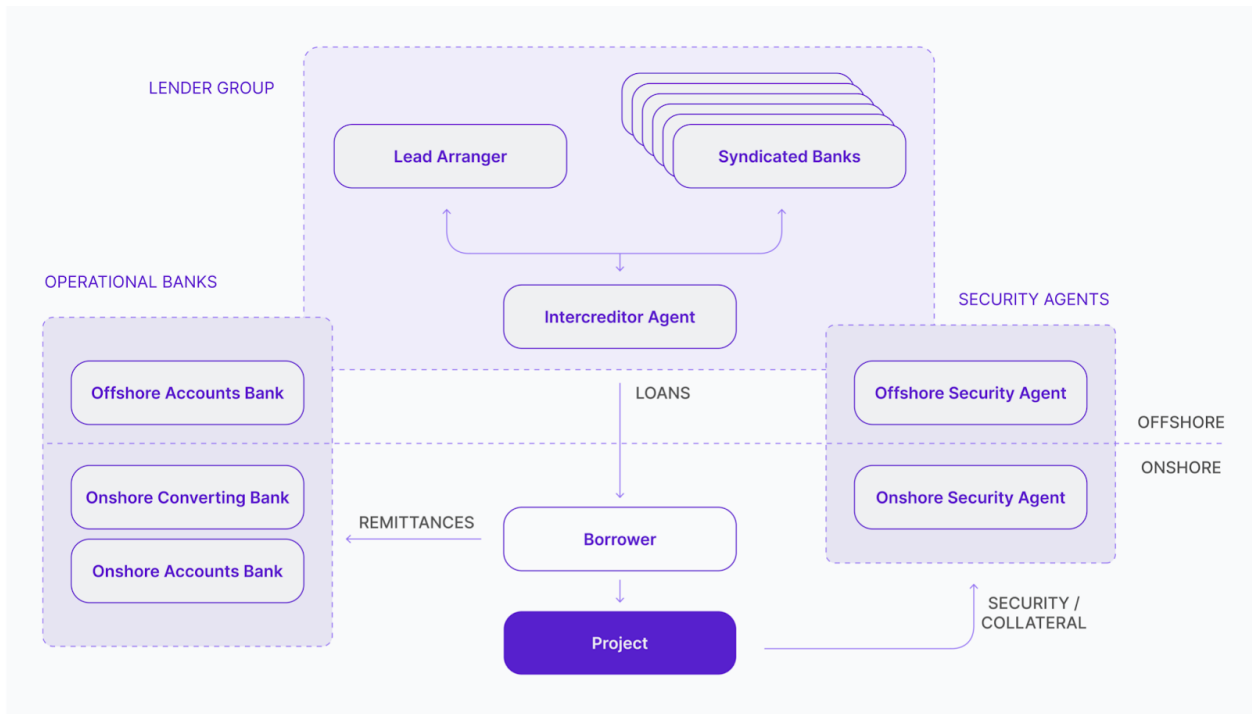


Figure 4. A typical financing structure in large-scale infrastructure projects.

The loan agreement will include a long checklist of conditions. After signing, the borrower must satisfy all of such conditions in order to reach financial close and be able to draw on the funds. As one aspect of this process, putting together the collateral for the debt is far from trivial. Figure 5 shows some of the components in the collateral.

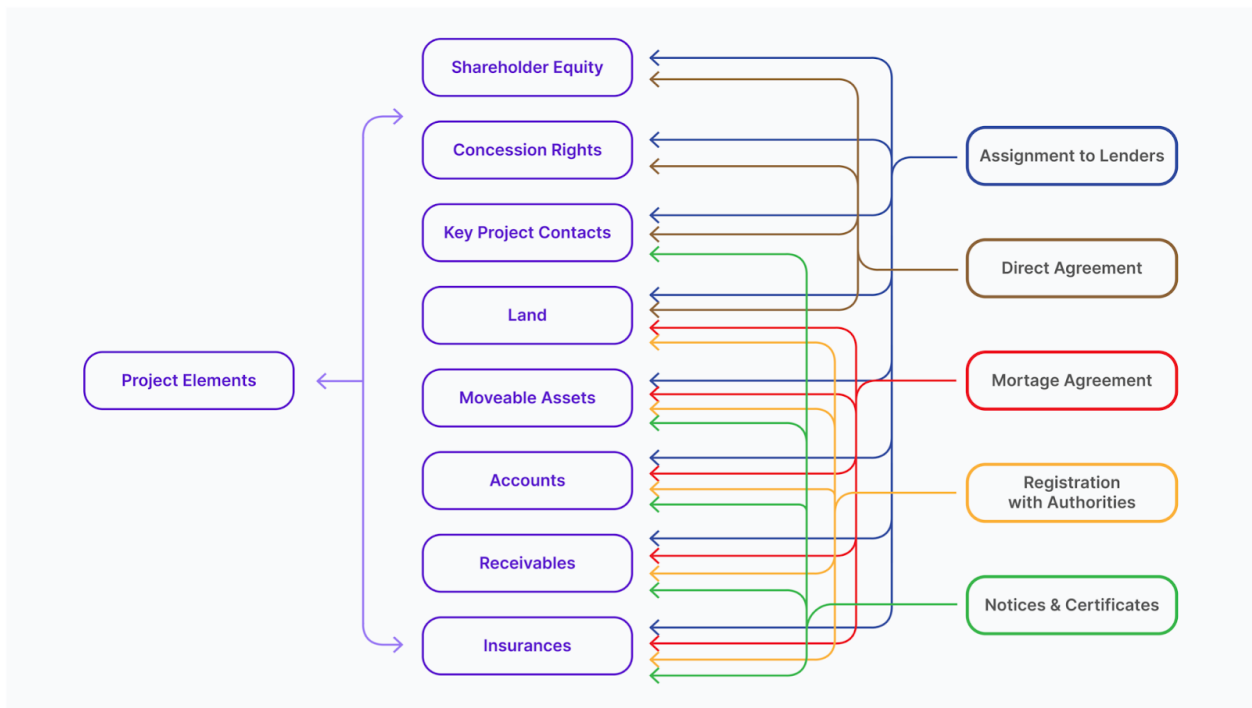


Figure 5. Elements of loan collateral in infrastructure projects.

Commercial lending is an alternative to project financing. Loan terms are shorter (typically 5-7 years) and interest rates higher, exceeding 15% per annum in some markets. However, commercial banks are by nature conservative and may lack an understanding of the project fundamentals. This is especially the case for projects involving new technology or innovative sectors. But even if a project falls in commercial lenders’ comfort zone, there is still a lengthy process to assess the risk of default, determine loan availability, check loan documentation with advisors and lawyers. When all the closing deliverables are in place, the loan is approved and released.

Transaction costs

As discussed, the procurement process in project finance is complex and time-consuming. The bidding process may take years. The preparation of project tenders takes a large amount of advisory work on legal, technical, and financial aspects of the deal, and lenders will do their own due diligence.

As an example of what is involved, Silta co-founders are currently assisting a traditional project in a financial closing. This involves the borrower delivering over 430 documents, authorizations and certificates to the lenders. Construction is yet to start, but the developer has so far paid over US\$ 6 million in development cost and advisory fees. This amount, of course, includes fees incurred by the lenders’ advisors.

It is not uncommon for the total of advisory fees to run into the tens of millions of dollars before a single shovel hits the dirt. Using data from the UK, Dudkin and Vällilä (2005) found⁹ that transaction costs are generally in 2-4% of the total in projects valued above £25 million (see Figure 6). In smaller projects, the average transaction cost is about 8% of the total investment.

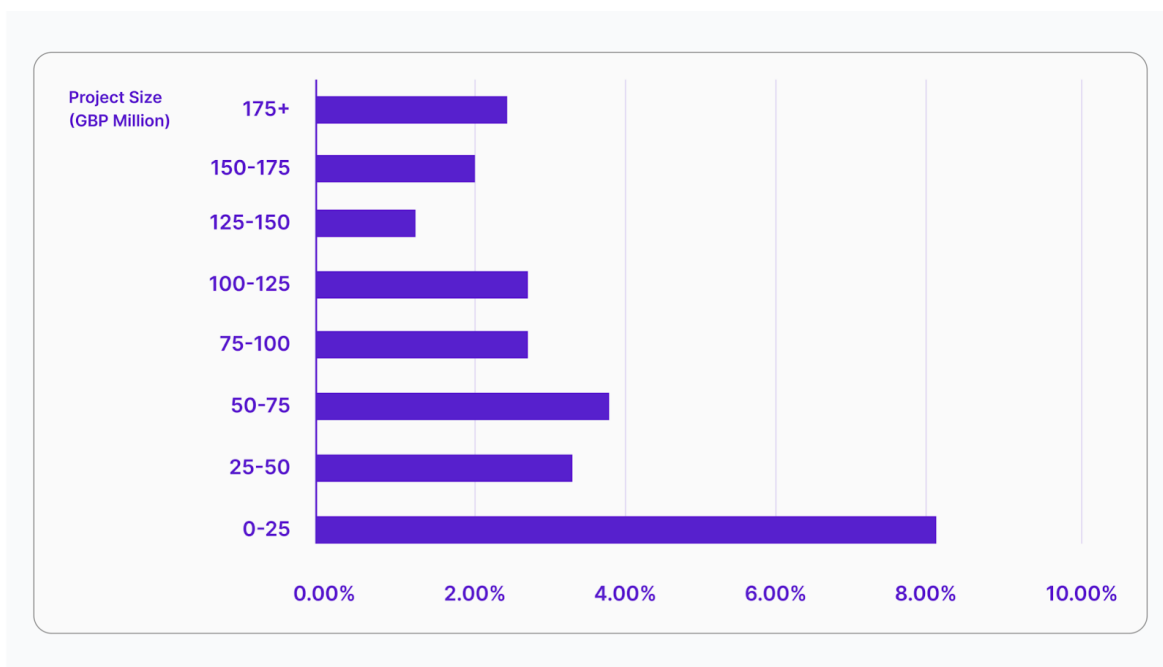


Figure 6. The transaction cost as percentage of project value in the UK (source: Dudkin and Vällilä, 2005¹⁰).

⁹ Op. cit.

¹⁰ Dudkin, G., & Vällilä, T. (2005). Transaction Costs in Public-Private Partnerships: A First Look at the Evidence. *Competition and Regulation in Network Industries*, 1(2), 307–330.

Given the cost and complexity of infrastructure projects, some governments have issued guidance on threshold project size, even if the use of such limits is a matter of debate both in academia and in industry practice. In many developing countries, there are grass-root infrastructural issues which often necessitate private sector financing even in projects with a smaller value. Table 1 lists some countries with an explicit project size threshold.

Table 1. Minimum size threshold for PPP projects as set by the government in selected countries (source: Public Private Partnership Reference guide (2014) - World Bank, Asian Development Bank, Inter-American Development Bank).

Country	Minimum project size (US\$ million)
Australia	50
Brazil	11.7
Colombia	2.1
United Kingdom	29
Singapore	50

3. Decentralized finance

Decentralized finance is an ecosystem of financial applications built on top of distributed ledgers, enabling decentralized, trustless and permissionless financial services. DeFi relies on the application of smart contracts to finance. The users place their trust on a protocol or code instead of a financial services provider or other middleman. Decentralized finance (DeFi¹¹) can be contrasted with Centralized finance (CeFi). In CeFi, centralized entities (such as Binance) hold the users' assets in custody and allow them to invest in cryptocurrency products and earn interest or take up a loan.

DeFi was effectively born¹² in December 2017 with the launch of MakerDAO. It is a protocol which allows users to issue a cryptocurrency pegged to the value of the U.S. dollar, with other cryptocurrency tokens as collateral. MakerDAO protocol allows anyone to borrow the DAI stablecoin against Ether. Other notable DeFi applications include Compound (a market for collateralized crypto loans) and Uniswap (a protocol which allows users to swap any two tokens on Ethereum in a permissionless and trustless way).

Assets locked in DeFi smart contracts have climbed to more than US\$ 40 billion by late 2021 (Figure 7). By value locked in smart contracts, the top DeFi protocols (as of November 2021) include AAVE (US\$ 4.1 billion), COMP (US\$ 2.8 billion), CRV (US\$ 8.1 billion), MKR (US\$ 3.0 billion), and UNI (US\$ 21.1 billion).

¹¹ The term DeFi was coined in a Telegram chat in August 2018 between Ethereum developers and entrepreneurs (Inje Yeo of Set Protocol, Blake Henderson of 0x and Brendan Forster of Dharma).

¹² See <https://coinmarketcap.com/alexandria/article/what-is-decentralized-finance>.

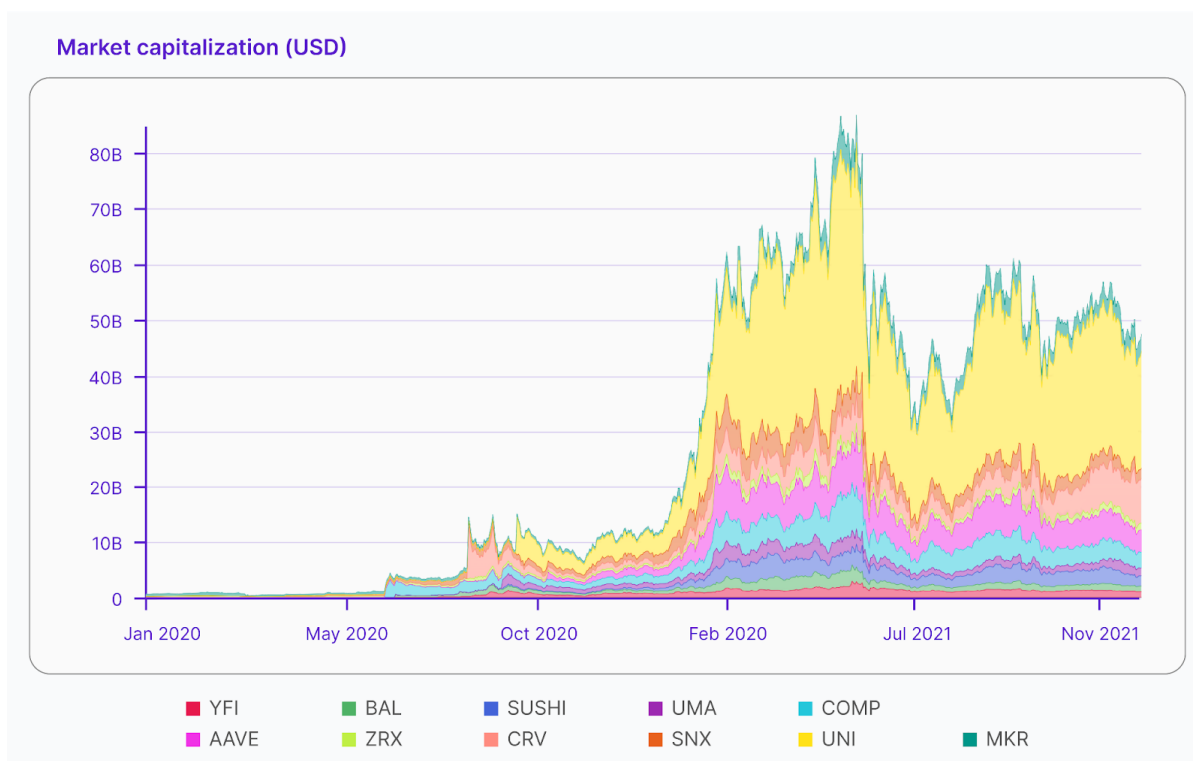


Figure 7. Value locked in DeFi smart contracts (in US\$) as of 30 November, 2021. Source: [CoinMetrics](https://www.coinmetrics.com).

While DeFi is still small relative to traditional finance, there are reasons behind the rapid growth. DeFi apps are non-custodial: Users do not need to hand over control over their assets, held in wallets protected by private keys or locked in smart contracts. With no need for a trusted third party, there is minimal principal-agent risk.

Access to DeFi apps is open for all regardless of country and jurisdiction. Because the protocols are built on top of public ledgers such as Ethereum, it is practically impossible to prevent access to DeFi apps or stop them from functioning. Decentralization also brings immutability and censorship resistance.

The open-source code in DeFi apps is free for anyone to inspect. This makes it easy for developers to build on top of existing applications. The ecosystem is composable; the apps are like “money legos”. DeFi facilitates the automation of financial services and contributes to market efficiency through lower costs, faster settlement, improved price discovery, and easier access to arbitrage opportunities.

Ethereum is the *de facto* standard blockchain in this space. More than 200 DeFi apps exist, and about 95% of those are built on Ethereum. Ethereum-compatible blockchains include the Binance Smart Chain, and there are also DeFi apps for Bitcoin. If we look at the most popular DeFi apps (Figure 8), Uniswap (UNI) is the most active DeFi app at present. It is followed by SushiSwap (SUSHI), Curve (CRV), Aave (AAVE), Synthetix (SNX) and Compound (COMP).

Liquidity pools (LP) are an important part of the technical foundation for DeFi. In essence, a liquidity pool is a repository of two or more different tokens locked in a smart contract. LP’s can be used to implement various DeFi use cases, including decentralized exchanges and borrowing/lending protocols.

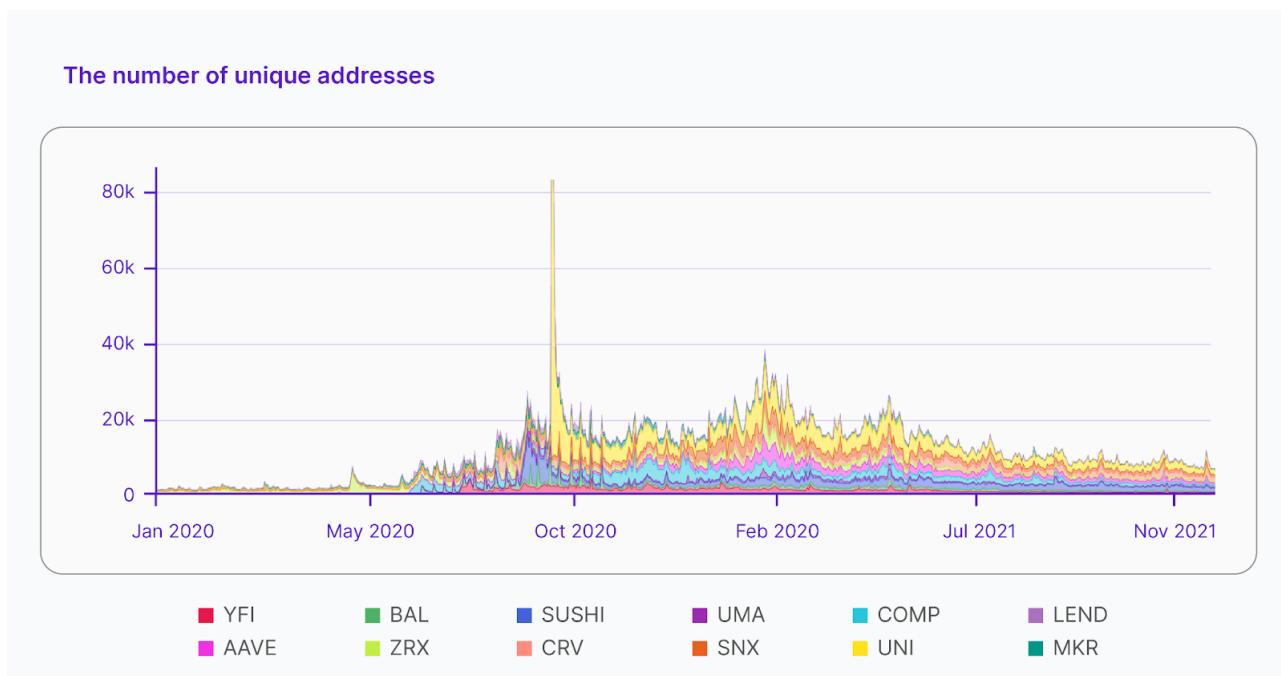


Figure 8. The number of unique addresses (through November 2021) that were active in the network either as a recipient or originator of a ledger change (a large peak in September 2020 due to UNI airdrop is not shown in full, and the y-axis is truncated for readability). Source: [CoinMetrics](https://www.coinmetrics.com).

A liquidity provider deposits tokens (in the simplest case, an equal value of each of two tokens) into the pool, and they earn passive income via trading fees. A liquidity provider is given so-called LP tokens as a record of their deposit. LP tokens are burned when the assets are reclaimed.

The inventory of tokens in a pool and the relative exchange rate between the tokens is controlled by an automated market maker (AMM). Users wishing to exchange one of the tokens against the other do so by transacting with a liquidity pool. In doing so, they effectively trade against a smart contract. Both sides of trades are pre-funded with tokens previously deposited in the pool.

Use cases

There’s a range of use cases for DeFi, including borrowing and lending protocols and decentralized exchanges.

1. In decentralized lending, users can lend cryptocurrency to others and earn interest on the loan. Borrowers pay interest on the principal and have to put up collateral¹³ (this is typically significantly above the loan amount). The biggest lending protocols currently are Maker, Aave, and Compound.
2. Stablecoins are backed via native cryptographic tokens or non-native, non-blockchain assets. Since a stablecoin is pegged to an well-established asset (typically US\$), the user does not need to unduly worry about the price volatility. Most stablecoins can fairly easily be

¹³ There are also so-called flash loans, where a smart contract can borrow tokens from a pool without collateral. The borrower can make use of the funds for e.g. arbitrage as long as the loan is paid back before the transaction ends. If the loan is not paid back within the same block, it is as if the loan never happened.

converted to fiat either directly or via ETH. Examples include Maker DAI, Binance BUSD, Tether USDT, USDC, and WBTC.

3. Decentralized exchanges (DEX) allow traders to swap tokens without a centralized exchange or a market maker. There is a wide variety of cryptocurrencies, and the less liquid ones are often hard to trade in decentralized exchanges. Most DEX protocols are built on top of liquidity pools and automated market makers. Popular decentralized exchanges include Uniswap, Bancor, Kyber, and the 0x protocol.
4. There are payment protocols such as the Lightning network for BTC. In this use case, the node operators in a peer-to-peer network facilitate near-instantaneous token payments by providing off-chain channels. Node operators receive a transaction fee as a reward for the service.
5. Token derivatives are provided by several DeFi protocols. Derivatives such as dYdX offer Bitcoin futures with leverage and settlement with USDC. TokenSets protocol allows for bundling crypto assets into tokenized baskets which are automatically restructured based on a predefined logic. Synthetix is a protocol for creating and trading synthetic assets (synths) on Ethereum.
6. There are prediction market apps which allow for collecting the “wisdom of the crowds”. PlotX allows the creation of liquidity pools for predicting event outcomes, with the event likelihood updated by an automated market maker mechanism. Augur is a decentralized prediction market on the Ethereum blockchain, with a native token (REP) used as the means of payment. Gnosis is also based on Ethereum, but with the focus on insurance and financial events.
7. There are some interesting examples in the insurance sector. Etherisc is a protocol for building decentralized insurance products against events such as crop failures. Nexus Mutual offers protection against smart contract hacks.

4. The opportunity

In infrastructure development, the complexity of the procurement and financing process is essentially the same regardless of project size. This may be no great surprise, given that the practice of project finance dates back to the 19th century shipbuilding and the railroad boom. With transaction costs more or less constant, traditional funding sources are in practice often inaccessible to smaller projects valued from a few million to approximately 100 million US\$.

At the same time, there is a global scarcity of relatively safe lending opportunities with a reasonable return on capital. There is a proven business model and steady financial returns in project finance, but the current practice prevents matching willing investors with a large segment of infrastructure investing.

A better alternative

If the current project finance practice could be simplified, there would be a sizable business and investment opportunity and significant pent-up demand in many parts of the world. This simplification is what Silta — a solution for channeling decentralized finance to building infrastructure projects — seeks to provide.

The aim of Silta is to standardize and streamline the loan arrangement process, simplifying due diligence and making risk assessment systematic and algorithmic. This allows for a simpler relationship between the borrower and the lenders. By doing so, Silta makes debt cheaper and accessible to medium and small infrastructure projects, while ensuring that the return on capital remains large enough to attract lenders.

There are several benefits in such a simplified system for all stakeholders. Silta can reduce the overall cost of infrastructure projects and give faster access to funding and the actual construction. With the digitization and automation of the process, a borrower can get a loan decision in days instead of months. Benefits to different stakeholders are summarized in Table 2 below.

Table 2. A summary of the benefits from the Silta solution to different stakeholders in infrastructure development. The benefits in the government column also apply to entities and project sponsors such as governmental agencies and international financial institutions.

Government	Project companies	DeFi ecosystem
Access to private sector loan pools	Simpler and faster loan arrangement process ¹⁴	Access to real assets in infrastructure projects
Avoid project delays by eliminating the funding risk	Significantly lower transaction costs	Easy access to long-term investment opportunities
Streamlined lending arrangements	Competitive interest rates	Good return on capital and lower risk profile
Good value for money	Access to additional source of capital in large projects	Support for the social and environmental good

Having a funding application approved in Silta constitutes effectively a pre-financing commitment. In project finance, having the funds ready helps a project company demonstrate the strength of their proposal and the ability to swiftly commence the actual work. This increases the borrower’s chance of winning the bid for the infrastructure concession.

By making project finance a viable option for a much wider gamut of infrastructure investment, governments and agencies can get more projects off the ground, accelerate economic growth, reduce unemployment through job creation and eventually provide better infrastructure for the public. This is the precipice of financial investments where blockchain technology can deliver game changing opportunities for individuals, private companies, and governments.

The opportunity for the DeFi community

The DeFi sector is innovative and exciting in many ways, but there are very few opportunities to invest in brick-and-mortar assets. A typical rate return on project finance falls in a range from 3% to

¹⁴ A simpler and faster access to funding brings other benefits, such as finding out the financing cost early in the bidding process, and hence the ability to refine the financial model in good time. Faster access to funding also helps the developer to a quicker project launch and shorter time to completion.

18%. While this may be modest compared to some of the existing DeFi products, lending to infrastructure development comes with relatively low risk.

As discussed in Section 2 on the cost of debt, the actual rate of return depends on several factors, including the country risk, project risk, the revenue model, project complexity, etc. The rate of return also depends on debt seniority.

Various kinds of financial products can be facilitated in Silta, including senior debt, mezzanine debt, asset backed financing, and generic corporate financing (Figure 9). In mezzanine debt, for instance, interest rates range from 7% to 20% per year, and the repayment periods are shorter than for senior debt. Later on, we will also explore the possibility of offering lenders additional token rewards on top of the interest rate. The reward for a specific product would depend on the underlying rate of interest and the tenor of the loan.

<hr style="border: 1px solid #4a4a9a; margin-bottom: 5px;"/> <p>Project Financing - Senior Debt</p> <p>7 - 25 years repayment period Typical interest rates: 4-15% p.a</p>	<hr style="border: 1px solid #4a4a9a; margin-bottom: 5px;"/> <p>Asset Backed Financing</p> <p>2-10 years repayment period Typical interest rates: 3-10% p.a</p>
<hr style="border: 1px solid #4a4a9a; margin-bottom: 5px;"/> <p>Project Financing - Mezzanine</p> <p>2 -15 years repayment period Typical interest rates: 7-20% p.a</p>	<hr style="border: 1px solid #4a4a9a; margin-bottom: 5px;"/> <p>Corporate Financing</p> <p>1-10 years repayment period Typical interest rates: 2-12% p.a</p>

Figure 9. Examples of financial products which can be facilitated in Silta.

The lifecycle of infrastructure projects usually spans across business cycles and economic downturns. As such, project finance can be a good fit to long term saving strategies for individuals and eventually for pension funds and other institutional asset managers. For DeFi lenders, investing in concrete infrastructure assets can be very helpful in avoiding the downside and the volatility during the ultimately unavoidable crypto winters or other periods of market weakness.

At present, DeFi loans are overcollateralized. This is because there is no way to assess the credit quality or differentiate between borrowers. Given the volatility in most cryptocurrencies, lending protocols are therefore obliged to impose collateral requirements many times the amount of the loan. In Silta, the loan pools are collateralised by Silta tokens pledged by the DAO. The borrower offsets the token collateral by putting up real-world collateral along with credit enhancement measures — such as loan covenants with step-in rights or government guarantees — where possible. In this way, Silta provides a way to use real-world assets to back infrastructure investments

By making project finance available to the crypto community, Silta has the potential of attracting brand new types of investors and helping crypto go mainstream. Gen X and the Baby boomers may not want to invest in new and perhaps confusing technologies, investing in a solar project with a steady interest year on year and government guarantees can be a totally different proposition. Silta helps shift DeFi lending from a high-risk, high-return modality towards a modality of lower risk and stable returns. By lending to building infrastructure, the community also contributes to a better environment and to the good of the society.

The same attributes that make infrastructure projects good investment opportunities to the DeFi community should be equally attractive to CeFi users. With Silta, CeFi and DeFi can work together to build a better world.

Market size

There’s a sizable potential market for the Silta solution. More than 6,400 infrastructure projects have been procured and delivered globally from 2000 through 2020 using the PPP model¹⁵. The total value in these transactions is about US\$ 2.9 trillion with an average deal size of US\$ 440 million. Europe and Asia Pacific are the largest regions by value, with total capital deployed at US\$ 875 billion and US\$ 850 billion, respectively.

The transportation sector is by far the largest recipient of PPP funding, accounting for 70% of the total (Figure 10). Social infrastructure and the defence sector have also received large PPP investments with 14% of the total investment. Other areas with significant PPP projects in the last twenty years include the oil and gas, power, water and telecommunications sectors, each representing between 3 and 4% of the global infrastructure spending.

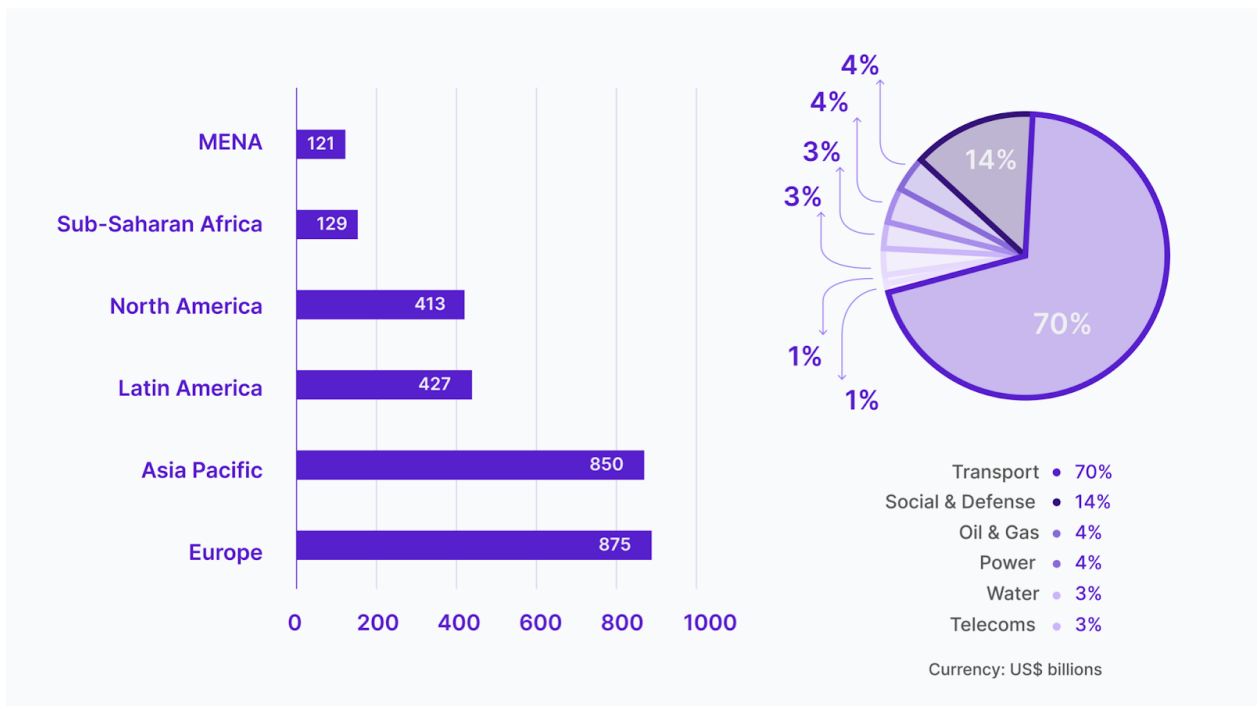


Figure 10. Global spending (US\$ billions) on PPP projects from 2000 to 2020 (source: IJGlobal)

¹⁵ Based on Silta team’s analysis of global infrastructure projects in IJGlobal database (www.ijglobal.com).

Nearly half of the deals in the past twenty years have been in smaller infrastructure projects with an investment amount less than US\$ 100 million (Table 3). The total value of spending in this category is about US\$ 125 billion, i.e. 4.4% of the total investment.

Table 3. Infrastructure deal size from 2000 to 2020 (source: IJGlobal)¹⁶.

Deal size (US\$ million)	Number of deals	Average deal value (US\$ million)	Total deal value (US\$ million)
0-100	3,098	41	125,421
100-250	1,312	165	216,480
250-500	885	353	312,405
500-1000	606	693	419,958
1,000-2,000	365	1,384	505,160
2,000+	275	4,727	1,299,925
Total	6,541	440	2,879,349

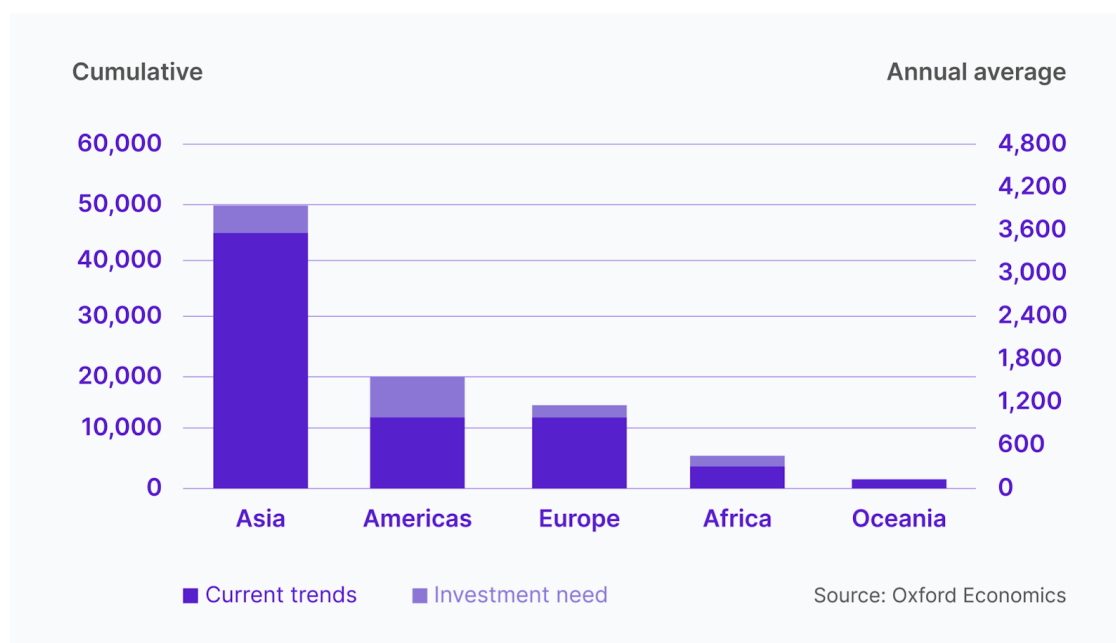


Figure 11. Estimated global spending on infrastructure from 2020 to 2040 (US\$ billions) by region (source: Oxford Economics/Global Infrastructure Outlook 2017).

As detailed in Figure 11, the market is growing. The investment spending on infrastructure is expected to increase along with population growth and urbanisation in Africa and Asia. There is also significant investment demand in Europe and the Americas, where the infrastructure is ageing and needs

¹⁶ Based on Silta team’s analysis of global infrastructure projects in IJGlobal database (www.ijglobal.com).

replacing and upgrading. **The projected infrastructure investment is about US\$ 94 trillion through 2040, averaging roughly US\$ 3.7 trillion per year¹⁷.** Over half of this is expected to take place in Asia, where the investment needs add up to roughly US\$ 50 trillion between 2020 and 2040.

By sector, the projected infrastructure spending is greatest in electricity (power plants and transmission grids) and road networks (toll roads and other). These two sectors together add up to about 67% of the expected investment. The remainder is split between the rail sectors, telecoms, water systems, airports and ports (Figure 12).

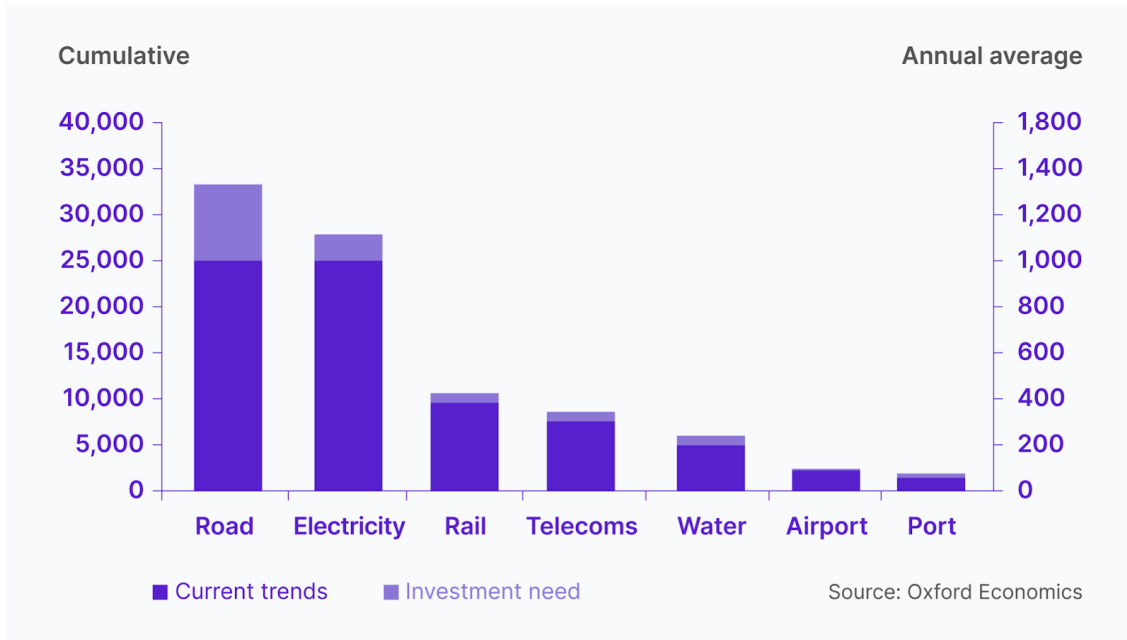


Figure 12. Projected global spending on infrastructure to 2040 (US\$ billions) by sector (source: Oxford Economics/Global Infrastructure Outlook 2017).

Silta can be used to inject capital into both new and existing infrastructure assets, i.e. either to greenfield or to brownfield projects. The latter case corresponds to refinancing existing debt, a practice which is very common in traditional project finance. Refinancing can be advantageous to lenders, given that the process is generally shorter and simpler than for greenfield projects. However, borrowers will only opt for refinancing if the terms of the new loan are better than the original loan, taking into account any loan breakage costs.

5. The proposed solution

Silta is a solution which forms a bridge between DeFi and real-world assets. It connects two sides with compatible needs. Borrowers looking to build physical assets gain access to financing pools where funds are aggregated from a large and diverse group of lenders. Lenders gain access to projects that yield steady long-term returns. Through the Silta DAO, the community gets to decide which projects merit opening a loan pool (with Silta tokens used as collateral), and helps guide the future direction of the technology.

¹⁷ Global Infrastructure Hub (www.gihub.org).

The Silta solution consists of several key components: A transaction pipeline, a proprietary rating methodology, smart contract based loan pools, and a decentralized governance system.

- A **transaction pipeline** is a repository of financing applications submitted by borrowers. An application includes information about the borrower and the project, the size of the required investment, and other kinds of data which are needed for due diligence and risk assessment.
- Each application which passes the initial screening is assessed on key fundamentals and risks, and a numerical **Silta score** is assigned to it. The rating is part of the due diligence process which aims to quantify and benchmark various kinds of risks from financial close until the debt has been fully repaid. See Section 5.2. for the rating methodology.
- There is a **loan pool** (LP) for each infrastructure project approved by the Silta DAO. During the contribution period, lenders are able to insert liquidity into the third-party pool. The collateral (in Silta tokens) comes from the treasury of the DAO. The contributors receive LP tokens representing their share of the pool. Lenders can also receive liquidity rewards in the form of Silta tokens. For more detail on the funding model, see Section 5.1.
- **Governance** of the Silta solution is handled by the Silta DAO¹⁸. The DAO is in control of whether a funding application is approved, a loan pool opened and collateral put forth. The community can also propose and vote on strategic decisions and technology improvements. Silta governance is described in more length in Section 5.4.

Silta dApp is the interface between the community and the solution. The dApp allows for a connection with a compatible wallet¹⁹, and it will show the loan pools where contributions have been made by the wallet owner. The dApp also maintains the transaction pipeline, shows projects where a governance vote is due, facilitates voting by the DAO, gives easy access to loan pools which are open for contributions, and tracks the progress of projects already funded.

The Silta token (a fungible ERC-20 token) is a critical part of the solution. Token holders have certain decision-making powers: They can approve or reject funding applications, create Silta improvement proposals, and vote on strategic decisions. Silta tokens are also required before a borrower can access the Silta dApp, initiate a loan application or get an application rated.

Silta Finance AG is a Swiss-based company which makes the solution operational, and it coordinates the technical implementation and contributions to the codebase by the community. The founders bring in the industry knowledge and their professional networks. The business model of the company is based on fees that are charged to the borrowers, i.e. a loan arrangement fee and annual loan service fees.

The funding model in the Silta solution is described in more detail in Section 5.1. Building physical assets will not always go as planned, and Section 5.2. deals with cases where a project goes awry. Section 5.3. looks at the rating methodology behind the Silta score. Section 5.4. describes the governance model, and Section 5.5. focuses on the Silta token.

¹⁸ A decentralized autonomous association (DAO) is an entity where the rules of governance are hard-coded as a collection of smart contracts and executed when required.

¹⁹ The wallet can be Metamask or one of the many alternatives.

5.1. The funding model

Financing by Silta is arranged through third-party loan pools where borrowers can draw funds from for building specific infrastructure assets. With the approval of the DAO, Silta tokens (from the DAO treasury) are provided as collateral for each such pool. Once sufficient funds have been contributed to the pool by lenders, a legally binding collateral agreement is signed between the borrower and a **security agent**, i.e. a company acting on behalf of the DAO. With the loan documentation duly executed, funding is made available to the borrower.

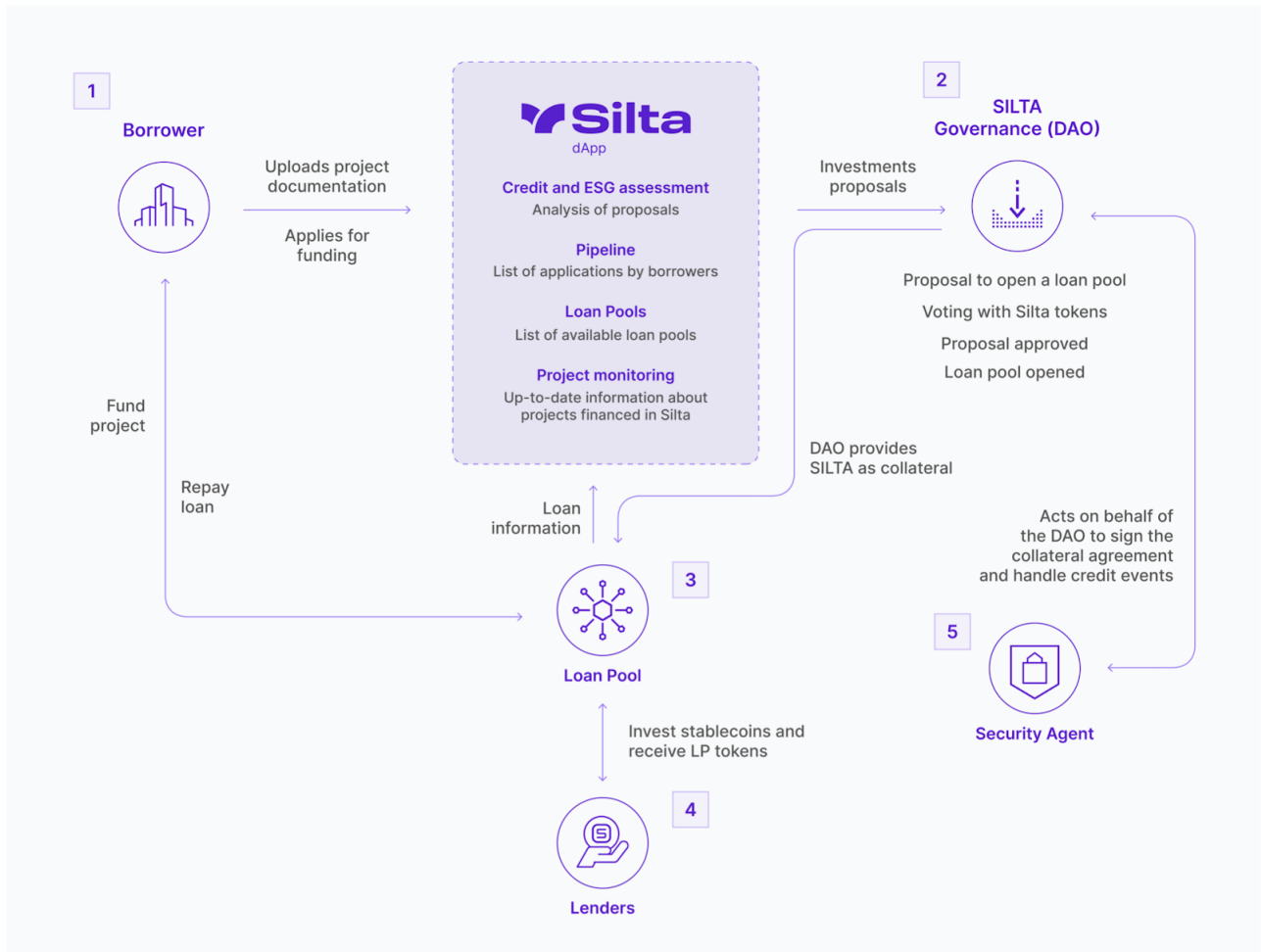


Figure 13. Stakeholders and token flows in the Silta solution.

Figure 13 shows a high-level diagram of the funding model in Silta. These are the main stakeholders and elements in the solution:

1. The borrower is the entity which seeks to raise debt for financing a specific physical asset. To raise funds through Silta, the borrower first onboards on the dApp²⁰ and then submits an

²⁰ In the onboarding process, a borrower needs to prove their identity is needed, and there are various checks and a KYC/AML process where required by law. Additional documentation (such as an extract from the company registry and a certificate of good standing) is required from the project companies, and the borrower's corporate entity needs to appoint representative(s) with legal signature rights. Silta verifies the information before access is granted.

application for funding. An application includes information about the borrower, a description of the planned physical asset, the geographic location, the size of the required investment, financial projections, and other kinds of data which are needed for due diligence and risk assessment

2. The Silta DAO decides whether to approve each funding application. The governance process involves a vote by DAO members, each of whom will be a token holder. With the approval by the DAO, a sufficient number of Silta tokens is pledged from the DAO treasury as collateral to the loan pool. New collateral tokens are minted as required²¹, and the collateral is placed in an escrow account²². For more information on governance, see Section 5.4.
3. The loan pool is technically a collection of funds locked in a smart contract in a third-party loan pool protocol. Each loan pool smart contract includes a hash of the loan documentation. It also defines the maximum size of the pool, various parameters, the currency of denomination, the contribution period, the lockup period, the yield, and a liquidity reward schedule.
4. Lenders consist of institutions and investors willing to finance the project in question. Each potential lender needs to undertake a KYC/AML process. After a successful KYC/AML check, a lender's wallet address is whitelisted in the loan pool contract. Stablecoins can be sent to the pool by whitelisted investors during a contribution period.
5. The security agent acts on behalf of the Silta DAO in handling the loan pool collateral and any credit events. When the loan documentation is complete, the collateral (Silta tokens) is transferred from the escrow contract to the pool, and funds (stablecoins) in the pool are released to the borrower's cryptocurrency wallet. The borrower converts the stablecoins into fiat currency as required.

The Silta dApp ties the solution together (see Figure 14 below for an early example of what it looks like). The dApp allows potential borrowers to submit applications for an initial review by the Silta team. The team will be monitoring industry databases in target markets for upcoming projects and liaising with the local developers to build and update the transaction pipeline²³. Borrowers funded in Silta are obligated to keep the security agent up to date on progress in building and operating the asset as well as the borrower servicing the loan, and the dApp will convey the information to the community. The dApp will also show the applications up for vote by the DAO and the loan pools which are open for investment.

²¹ Newly minted collateral tokens only enter the market in a liquidation event (see Section 5.2). Unless there is a credit event which cannot be remedied, collateral tokens do not add to the circulating supply; they are burned once the loan is fully repaid.

²² The escrow account (a smart contract of its own) is implemented in such a way that the collateral can only move to the loan pool contract (in case a pool is successfully filled and ready for release to the borrower) or returned to the DAO treasury (in case filling and releasing the loan pool to the borrower fails for any reason).

²³ There are yet other sources for additions to the transaction pipeline, including PPP priority lists maintained by government agencies in countries where the project finance model is common.

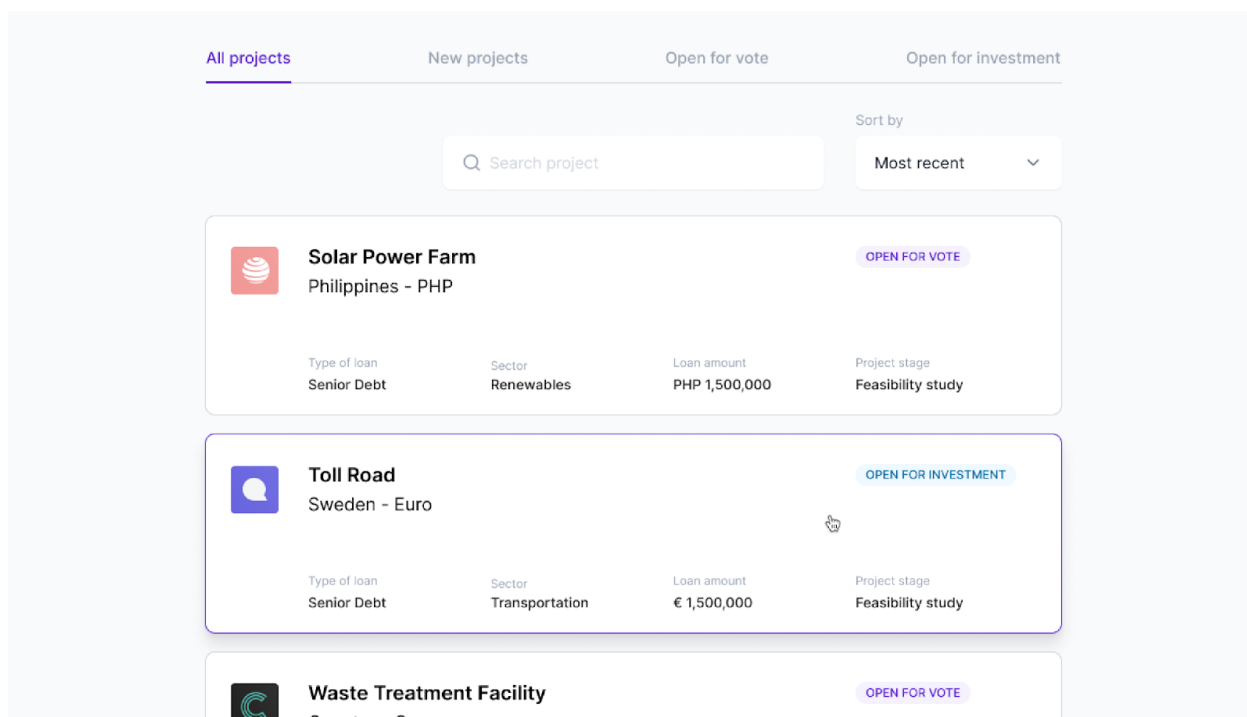


Figure 14. A sample dashboard in Silta dApp showing funding applications.

As a recap, these are the steps in a typical transaction on Silta:

1. A borrower applies to Silta for financing²⁴ and uploads the required documentation. Depending on the case, the relevant documentation might include a feasibility study, a business plan, constitutional documentation for the borrower's legal entity, the key agreements and the financial model.
2. Silta checks that the application meets the eligibility criteria (e.g. geographic location, sector, funding requirements, asset type, form of offtake agreement, payment obligor, payment guarantor etc).
3. If the application passes the initial screening, a due diligence, risk and sustainability rating is done by Silta and a Silta score is assigned to the application. Metadata about the project, the key data points and the score are stored in the blockchain. Silta may take an assessment fee to cover the cost of work up to this point.
4. Silta proposes an interest rate (the APY) for the project in line with comparable projects on industry databases. The interest rate is a function of the base rate, the time to maturity, the margin charged by the third-party loan pool protocol, and the credit spread. The credit spread, in turn, depends on Silta score and on the loan terms, covenants, and guarantees.
5. The funding proposal is added to the transaction pipeline with a summary of the project, the amount of funding sought (i.e. the loan amount, the Silta score, the proposed lending terms and the annual yield).

²⁴ In the stapled finance model, it is possible for the government or an international financial institution to initiate the loan application process.

6. The DAO votes on whether to approve the loan application. A third-party protocol (such as Snapchat) will be used in voting.
7. If the application is approved by the DAO, the required amount of collateral is minted and transferred from the DAO treasury to an escrow account²⁵. The circulating supply of the Silta token remains unchanged.
8. A loan pool is created by a third-party DeFi protocol²⁶. The loan pool is opened for potential lenders when the contribution period begins. Contributors receive LP tokens as a record of their share in the pool.
9. Once a sufficient amount of funds has been contributed to the pool or the contribution period ends — whichever takes place first — the pool is closed. If the funds in the pool fail to reach the target, contributors can reclaim their funds via LP tokens and the collateral tokens are returned to the DAO treasury²⁷.
10. If the pool is successfully filled, the loan documentation between the borrower and a security agent is executed. The documentation includes a collateral agreement which specifies the number of tokens in collateral, the interest rate, the tenor of the loan, and any covenants, government guarantees and step-in-rights. The applicable covenants are expressed in terms of customary financial ratios on the loan service and on the performance of the asset.
11. The collateral tokens are moved from the escrow account to the loan pool contract, and the funds (stablecoins) contributed by the lenders are released and transferred to the project company's cryptocurrency wallet. Depending on the size and nature of the project, the release may be done in tranches over the construction period. In most cases, the borrower will convert the funding to fiat currency via a third-party financial institution.
12. Loan service will commence after the construction phase ends and the asset becomes operational. Repayment of the loan with interest will be made periodically over time as defined in the loan contract. Repayment by the borrower will be made in the same stablecoin in which the loan was issued. Cash flows from both the borrower's and the lender's perspective are illustrated in Figure 15 and Figure 16, respectively.
13. Once the project has been completed successfully and the loan has been repaid in full, the obligations of the borrower and the security agent end. The collateral tokens are returned to the Silta DAO's treasury and burned.

Where possible and appropriate, a loan pool will be denominated in stablecoins pegged to the local currency of the project or another currency backed by stablecoins of the borrower's choosing. In the U.A.E, for instance, the funds would likely be pegged to Dirham. In the Philippines, the funds would likely be pegged to the Philippines Peso. Using the stablecoin equivalent of the local currency minimizes the exchange rate risk, given that the expenses accrued by the project company (as well as the income in the operational phase) are denominated in that same currency.

²⁵ The escrow account is a smart contract which only allows an outgoing transfer to the loan pool contract (if funding goes ahead) or back to the DAO treasury (if the transaction fails).

²⁶ The application may also relate to a project where one or more project companies have already applied for funding. In such a case there is no need for a new loan pool.

²⁷ Reclaiming the funds results in burning the LP tokens held by the investor.

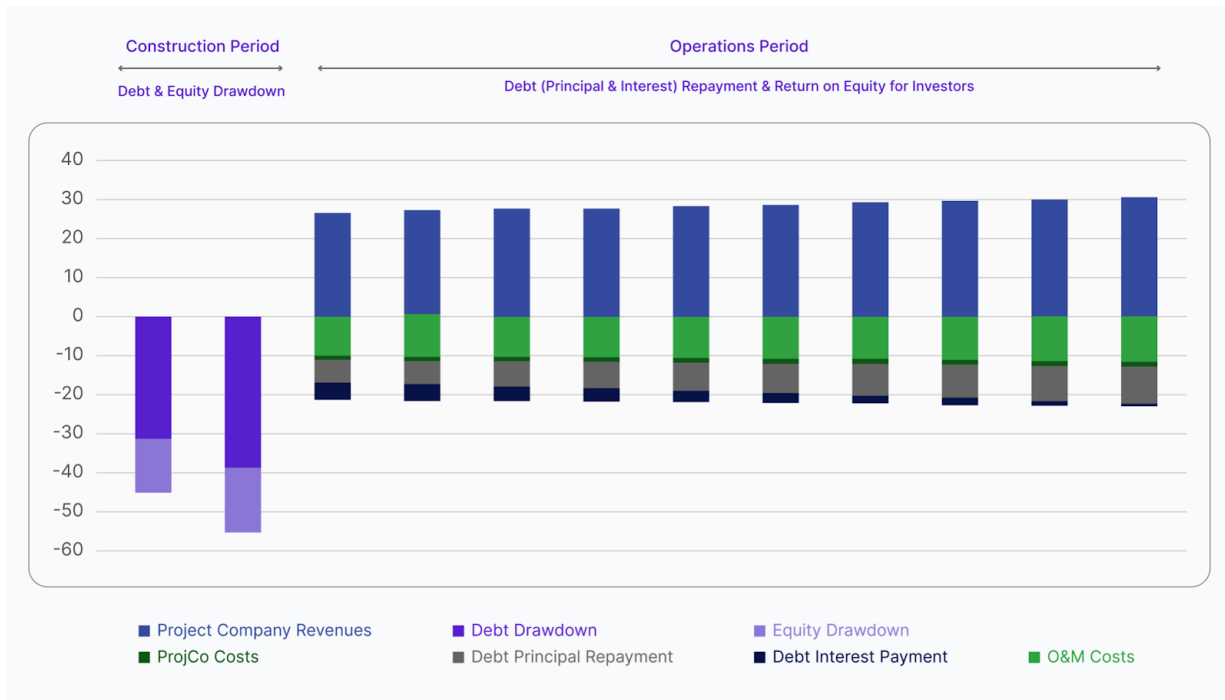


Figure 15. A cash flow profile example for an infrastructure project from the borrower’s viewpoint. The debt and equity are drawn during construction, and revenue and cost cash flows occur during the operational period.

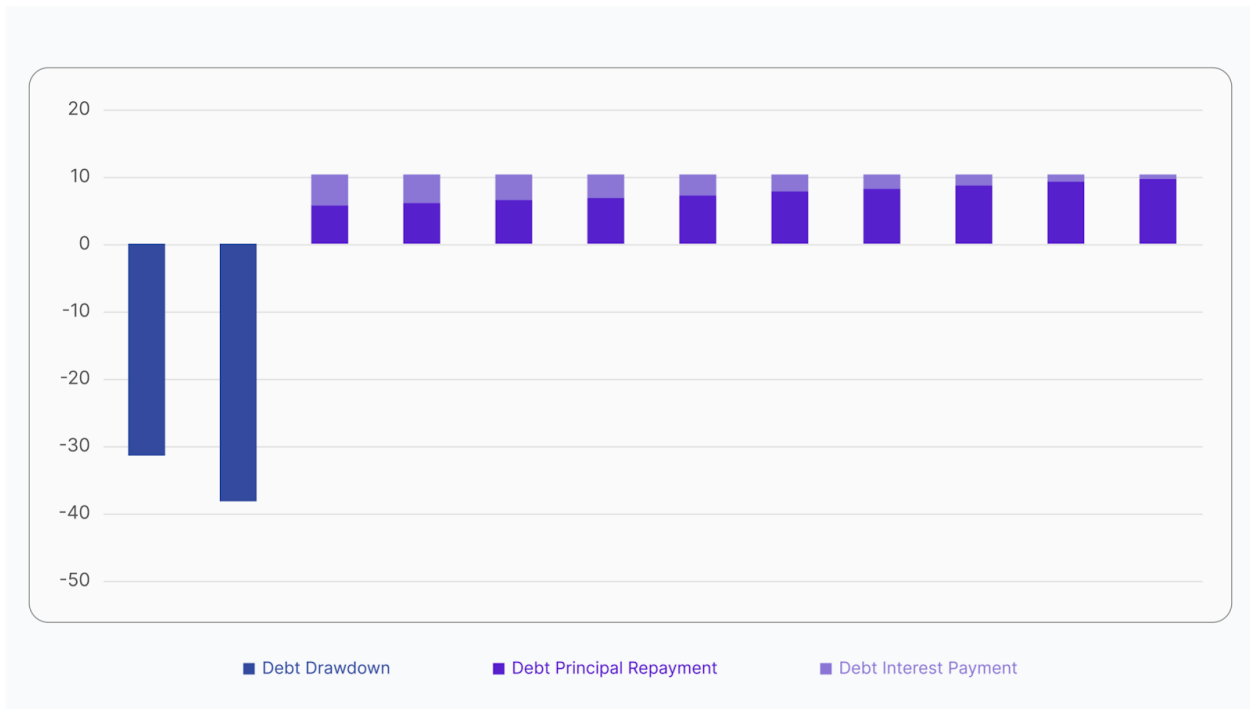


Figure 16. A cash flow profile example from a lender’s viewpoint. The interest starts to accrue at the first drawdown of the loan, and is typically paid quarterly or semi-annually. The principal and the interest are repaid during the operations period.

5.2. Handling credit events

There are two kinds of possible credit events which may affect the loan pools. Because of fluctuations in the market value of the Silta token, it may be that the value of the collateral falls below a level that is sufficient to cover the outstanding loan amount. It may also happen that the construction or the operation of the infrastructure asset runs into problems, and a borrower misses an interest payment or fails to pay back the principal.

Looking at the first case, there is a maximum amount that can be borrowed from a DeFi loan pool against the collateral. In the Silta case, the loan principal (i.e. amount of debt funding) is defined on the borrower's application and is therefore a known quantity. The size of the principal and the **collateral factor** (a parameter) are used to calculate the number of Silta tokens needed as collateral from the DAO treasury. If the market price of the Silta token drops, the value of the collateral drops simultaneously. If the collateral value declines below the borrowing capacity implied by the collateral factor, one of two things needs to take place: Either more collateral is put up or the size of the outstanding debt is scaled back.

If the collateral value falls below the **support threshold**²⁸ (a parameter) but the loan is still being serviced by the borrower as normal, the DAO will step in to support the loan pool by providing additional collateral. New Silta tokens are issued and placed as additional collateral in the pool. The number of newly issued tokens is sufficient to make the collateral value larger than the support threshold by a safe amount, i.e. by the **support margin** (a parameter)²⁹.

If, however, there is a credit event³⁰ and there is no quick remedy available, it may well be the case that any level of support by the DAO is insufficient to keep the loan pool solvent. In such a case, the loan will be partially repaid by liquidators to make up the shortfall. This is how the process works:

- The DAO and the security agent are informed about a credit event, e.g. a missed interest payment or a failure to pay back the principal by the borrower.
- If possible, the security agent will recommend a specific remedy (e.g. a grace period for the missed payment).
- Based on the borrower's ability to fulfil the remedy (if any), the DAO makes a decision on whether or not to provide additional collateral.
- If there is no available remedy (or the borrower cannot meet the remedy), no additional collateral is granted, and the collateral value drops below a **liquidation threshold**³¹, a liquidation event occurs³².

In a liquidation event, the loan pool is open to interaction with third-party liquidator bots. A bot will interact with the loan pool smart contract API and buy collateral Silta tokens against stablecoins at discount. The proceeds are injected back to the loan pool to raise the collateral value back above the

²⁸ The support threshold parameter is a percentage >100% of the outstanding loan. The support threshold is always smaller than the collateral factor.

²⁹ Collateral tokens do not in normal circumstances increase the circulating supply. If the loan is serviced as normal and supported by the DAO when needed, any additional collateral tokens are burned once the loan is fully repaid.

³⁰ Technically, there is a credit event if the borrower fails to follow the payment schedule defined in the token collateral agreement between the borrower and the security agent.

³¹ The liquidation threshold parameter is a percentage >100% of the outstanding loan. The liquidation threshold is always smaller than the support threshold.

³² The collateral factor, the support threshold, the support margin, and the liquidation threshold are all parameters of Silta loan pools. These parameters (to be applied to future pools) can be changed by the Silta DAO after a due process with a proposal to the community and a vote by the DAO.

liquidation threshold. As the end result, the balance of the outstanding loan declines to a level where the collateral is again sufficient to cover the principal.

If a remedy for a default event is not successful or there is an outright failure to repay the loan, the security agent will take off-chain measures which depend on the terms of the collateral agreement³³. If there are government or parent company guarantees, these are pursued by the agent. If there is physical collateral, the agent can take the borrower to court and seek to liquidate the asset. In any case, proceeds from pursuing the collateral are remitted by the security agent to the treasury of the Silta DAO³⁴.

In project finance for public infrastructure, it is fairly common that loans are secured in the concession agreement between the borrower (a project company) and the procuring authority on the government side. Where applicable, the intention is to structure collateral agreements in Silta as senior debt. In the case of default, senior debt holders are prioritised, even if the full repayment cannot necessarily be guaranteed.

5.3. Silta score

As a part of the funding process, each application is assessed for various risks. A Silta score is an indication of the borrower's likelihood of successfully completing the construction phase and on the asset generating cash flows which are sufficient to cover the debt obligations. The risks will be evaluated, quantified and benchmarked to similar projects

The Silta score is more than one number. Each application is assessed for its strength in a number of dimensions. For instance, a part of the assessment of the financial performance might be an evaluation of the project's debt service coverage ratio (DSCR). In the end, the score is effectively a list of metrics summarizing the project's structural, financial, and environmental standing. The Silta score is presented to the community before the DAO votes on whether the application is allowed to be moved ahead in the funding process.

Inputs to the rating process are provided by borrowers. Each applicant nominates a legal signatory with the authority to upload documents and submit information to Silta. The terms and conditions for access constitute a legal obligation on the part of the borrower to only provide data which they know to be true and complete.

As part of the assessment, each project is scored on environmental, social and governance (ESG) criteria. It is evident that many institutional investors are increasingly concerned that new infrastructure is resilient and environmentally sustainable. We would not expect private investors in the DeFi space to be any less conscious about the future of the planet and humanity. In making the ESG assessment operational, there are several international standards — such Sustainable Development Goals (SDGs³⁵) — which can be used by Silta to analyse the sustainability of an infrastructure asset.

In general, infrastructure projects are exposed to various types of risk in different stages of the project lifecycle. There are also external risk factors which are present throughout the concession

³³ At this stage, third-party advisors or administrators may need to be appointed by the security agent.

³⁴ Given that there will typically be a large number of contributors — with many of them private individuals not used to dealing with default situations — having a security agent in place is a key part of the Silta solution.

³⁵ These goals are included in The 2030 Agenda for Sustainable Development, adopted by all United Nations member states in 2015. See <https://sdgs.un.org/goals>.

period. For an overview of the rating process, see Figure 17. The inputs include project-specific factors as well as more general credit quality drivers.

- Project-specific inputs (provided by the borrower as part of the funding application) include asset details, technical specifications, financial projections and supporting documentation. This information is sourced from the project company, its advisors, contractors and regulatory agencies.
- Generic credit quality drivers include macroeconomic and financial market indicators as well as quantitative precedents in similar projects. These inputs are available in external databases from the World Bank, Bloomberg, Thomson Reuters, and credit rating agencies such as Standard & Poor’s, Moody’s, and Fitch. The relevant data sets will be updated from external sources and from the internal Silta data repository.

The construction phase starts at the financial close, i.e. at the point when the funds in the loan pool are released to the borrower against the loan documentation. At the end of the construction phase, the borrower needs to demonstrate that the physical asset has been built in accordance with the specifications and it performs as intended. The demonstration usually involves a series of practical performance tests.

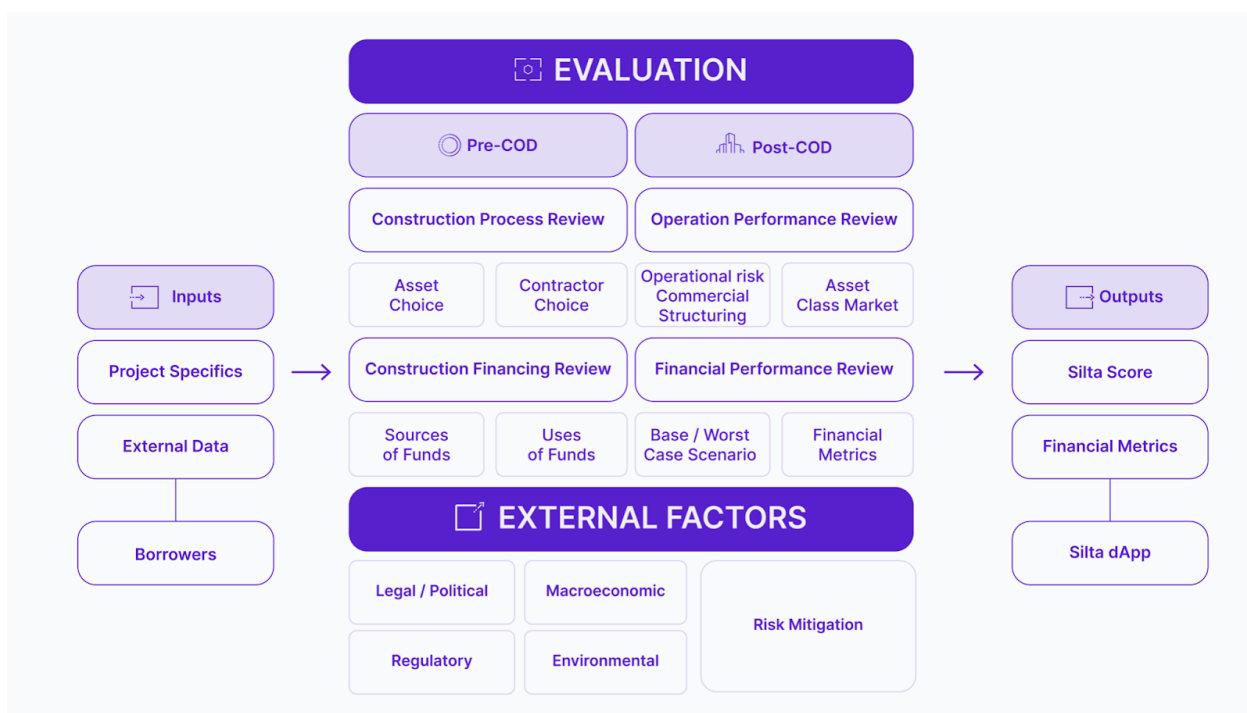


Figure 17. An overview of the rating methodology used in Silta.

The construction phase is generally accepted as a period of elevated risk. The choice of technology, conditions on the site, and the choice of contractor constitute the key areas that the credit assessment will focus on. The project company usually nominates a so-called EPC contractor with the contractual obligation to design and build the asset in accordance with the specifications as set out in the project bid. In the industry practice, the EPC contractor provides guarantees that the design and the end result do in fact fulfil the specifications.

The operational phase starts when construction is complete, the asset is proven and handed over by the EPC contractor, and is formally accepted by the borrower (a project company)³⁶. Depending on the project particulars, the operational phase may last anywhere from 5 to 30 years. It ends when the debt is fully repaid, but there may also be a “tail”, i.e. the period of time between the expected debt maturity date and the end of the PPP concession term. In recent years, long-term debt has been more difficult to source. Alternative debt structures with shorter tenors have become more common.

In the operational phase, the following factors are relevant for the risk assessment:

- The choice of technology and the complexity of operating and managing the asset.
- The identity of the operator and their track record in managing similar assets in the past.
- The commercial structure and the tariff income/provisions/penalties under different performance scenarios.
- The quality and completeness of the project documentation.
- Any risk transfer to a third party (sub-contracting, insurances etc.), and the results from analysing such third party's financial standing.
- Exposure to volume/price risks and the competitive environment in the asset class and geographical location.

On financial performance, the risks are related to the project's ability to generate cash flows which are sufficient to meet its operational requirements and debt obligations. The rating process focuses on financial metrics under different scenarios. In this process, base case and worst-case scenarios are developed based on the expected performance of the project, forecasted macroeconomic conditions, the number and nature of physical assets, the tariff structure, etc. Cash flows are then calculated for contractual provisions, guarantees, credit support, cash sweeps, and financial reserves.

On the basis of cash flow calculations under different scenarios, the credit assessment focuses on various financial metrics, including major maintenance costs, the operational leverage, DSCR, LLCR and the debt structure. These metrics allow an evaluation of the project recovery risk through a review of default events, default case protections, and the credit event seniority waterfall.

In any project, there are external risk events which can materialise at any time and have a significant impact on the project's success. External risks include the following.

- Macroeconomic risks, e.g. the exchange rate risk, interest rate risk, and commodity price risk.
- Environmental risks, including the risk of natural disasters and extreme weather conditions.
- Legal, regulatory, and political risks. These include the uncertainty about enforceability of contracts, changes in the applicable regulations, the risk of war and political upheaval, and the risk of expropriation of assets.

While some of the risk events are outside of the borrower's direct control, there are a number of tools that can be applied to minimise their impact. Risk mitigation measures include commercial or political risk insurance, hedging of the currency and interest rate risk, and government-provided protection under PPP contracts. The Silta rating process considers the comprehensiveness of risk mitigation measures, the timeliness of payments and costs associated with any hedging transactions, and the exposure that remains.

In the calculation of a Silta score, the intention is to make use of existing industry databases which contain details of thousands of ongoing and completed projects. We also aim to build our own database of project-specific data over time. The process will be automated where possible, with a

³⁶ The hand-over date is known as the Commercial Operations Date (COD).

quantitative analysis carried out on the relevant risk drivers and on different factors influencing the likely success of the project.

5.4. Governance in Silta

Silta governance in Silta is largely decentralized, and the Silta token is a critical part of the decision-making machinery. In many of the strategic and operational decisions, the Silta DAO is the ultimate arbiter. The DAO consists of those Silta token holders who choose to connect their wallet to the Silta dApp.

When a potential borrower submits a funding application, the Silta community will be notified. Silta assesses the risks in the application and its compliance with ESG criteria. The Silta DAO decides on whether to approve the application or not. As described in Section 5.1., the approval by the DAO puts in motion the process where Silta tokens are reserved for collateral, and funds from a successfully filled loan pool are released to the borrower.

If a credit event occurs during the construction or the operation of the asset, the DAO will be notified of the absence of a scheduled cash flow. A credit event — at its mildest — might be an interest payment narrowly missed. On the other end of the scale, a credit event might consist of the borrower outright failing to pay back the principal.

Regardless of the exact nature of the credit event, the DAO decides on whether it is worth continuing to support the loan pool in question. If the DAO remains confident on the project even if the collateral value drops below the support threshold, it can mint new Silta tokens and provide additional collateral. If the DAO loses its confidence in the project, it will allow liquidator bots to step in and return the pool to solvency.

Silta token holders can also change the operational parameters and determine the direction of future development and can trigger expansion to new markets and sectors. For instance, community members might wish to change the collateral factor, or they might see a market opportunity in a new geographic area.

There will be a formal process where a community member can raise a proposal for consideration by the DAO. Such a proposal is known as a Silta Improvement Proposal (SIP). The guidelines on the specific powers of the DAO and for creating a SIP will be published before the Silta token is launched. Broadly, though, a SIP can be raised by any community member, and each proposal is open for discussion by the full community. The token holders then vote on whether the SIP is approved or rejected.

Although no final decision has been taken yet on how voting by the Silta DAO is best implemented, [Snapshot](#) is a good example of a popular decentralized voting system. In Snapshot, votes are tallied off-chain so that token holders do not need to spend gas in voting. Community friendly weighting schemes (such as quadratic voting) are also possible.

In summary, the community can participate in these kinds of decisions through the Silta DAO:

- Decide whether to open a new loan pool and pledge collateral for a loan application.
- Decide whether to support a loan pool in case of a credit event.
- Modify loan pool parameters.
- Determine the type of projects that can be financed.

- Expand into new markets, products and services.
- Integrate with new partners, e.g. third-party liquidity pools and exchanges.
- Implement support for new tokens and stablecoins.
- Develop novel functionality and additional features.

While holding more governance tokens always gives greater voting powers, our aim is to avoid situations where decisions are dictated by a small number of wealthy token holders. There are mechanisms like balanced or quadratic voting that can protect the rights of the community³⁷. Having different membership tiers with different rights and obligations is also a possibility. Major token holders could have a larger role in the overall strategy, with minor token holders having more influence on specific investment decisions.

5.5. Silta token

The Silta token empowers its holder to access the platform and take part in governance through the Silta DAO. Silta tokens are fungible, compatible with the ERC-20 standard, and will be launched on the Ethereum network³⁸.

We believe that Silta tokens will be classified as utility tokens at least in Switzerland³⁹. The Silta token gives its holder access to the Silta dApp, including access to a digital voting application by means of a blockchain-based infrastructure. This is the kind of functionality that supports a qualification as a utility token. In our view, Silta tokens are unlikely to qualify as securities under Swiss law.

At Silta launch or soon after, an initial supply of Silta tokens will be created. Some of the tokens will be sold in a private placement to fund the early stages of Silta development. An allocation will be made to the founding team and to the Silta corporate entity. An allocation to technology and industry partners is also a possibility.

The solution is technically compatible with an ecosystem where Silta tokens can be accrued from a number of sources. For instance, the Silta DAO may decide to set up a liquidity reward pool where LP tokens from a third-party loan pool are staked and Silta tokens earned as a reward. In such a pool, the reward schedule could be determined by a bonding curve with early contributors receiving rewards at a higher rate. In this way, early lenders would be incentivized to contribute funds in the loan pool and compensated for having funds locked in for a longer period.

An insurance pool is another potentially useful structure. Such a pool would effectively serve as a reserve fund, and it could be activated if there is a credit event and the security agent is asked to step in and initiate a remedy. There are occasions where a security agent would need to appoint third-party advisors or administrators to enforce the claims of the Silta DAO and to recover assets. Should a credit event materialise and the security agent see a need to appoint legal or administrative

³⁷ See e.g. Karjalainen, Risto (2020): "Governance in Decentralized Networks". A whitepaper, available at SSRN: <https://ssrn.com/abstract=3551099> or <http://dx.doi.org/10.2139/ssrn.3551099>.

³⁸ As stated in the beginning of the whitepaper, the content (including the token model) may undergo significant changes as the development progresses due to regulatory or legal requirements or other reasons.

³⁹ For FINMA guidelines on token classification, see this document and in particular the Section 3.2.2: https://www.finma.ch/en/~media/finma/dokumente/dokumentencenter/myfinma/1bewilligung/fintech/wegleitun_g-ico.pdf?la=en. The guidelines state that utility tokens will not be treated as asset tokens if their sole purpose is to confer digital access rights to an application or service and if the utility token can actually be used in this way at the point of issue. An important point is the fact that the connection with capital markets (a typical feature of securities) is missing. In the case that the tokens would be seen as utility/payment hybrid tokens, AML regulations would apply. Even then, the tokens would be unlikely to be classified as asset tokens.

advisors, Silta tokens in the insurance pool would be liquidated and the funds used to cover the relevant professional fees.

6. Silta roadmap

This section describes the high-level roadmap for the implementation of the Silta vision. As it is, Silta means 'bridge' in Finnish. We find the name apt for several reasons:

- There is a clear need for a bridge between DeFi and infrastructure assets for the social and environmental good.
- There is a deep Finnish connection among the majority of the founding team members.
- The last undertaking that one of the co-founders (Ben Sheppard) helped complete was a major bridge project (namely the Cebu Cordova bridge⁴⁰ in the Philippines).

The roadmap is divided into three milestones. In the spirit of the theme, the milestones are named after some of the most famous bridge engineers to grace the world with their formidable structures.

Milestone 1 (Roebling)

- Funding
 - Sale of Silta governance tokens to investors.
 - The token generating event.
- Development
 - Implement and launch the first version of the Silta web portal.
 - Implement the application process for borrowers.
 - Research the token model and bonding curves.
- Governance
 - Develop and implement the voting mechanism.
 - Test and launch the governance process using the Silta token.
- Marketing and community
 - Launch a marketing and PR campaign.
 - Engage with and grow the digital Silta community.
 - Develop product education material for the community.
- Partnerships
 - Discuss project loan requirements and terms with borrowers.
 - Establish partnerships with project companies.
 - Establish partnerships with DeFi protocols.

Milestone 2 (Telford)

- Development
 - Integrate with third-party DeFi protocols.
 - Refine the token model and the bonding curves.
 - Prepare the loan collateral documentation.

⁴⁰ <https://cclex.com.ph/>

- First project
 - Undertake project financing with a project company.
 - Manually assess the Silta score for a loan application.
 - Collateralize first loan with Silta tokens.
 - Launch a loan pool on a third-party DeFi protocol.
 - Issue a loan to the borrower.
- Marketing and community
 - Continue marketing and PR activities.
 - Engage with and grow the digital Silta community.
 - Continue the development of educational material.
- Partnerships
 - Continue building the borrower pipeline.
 - Engage with international financial institutions (IFIs) on staple financing.
 - Develop relationships with relevant protocols and third parties.

Milestone 3 (Brunel)

- Development
 - Automate the assessment of the Silta score.
 - Test the rating process in a live project.
 - Integrate to additional DeFi loan protocols.
 - Implement staking opportunities.
- Marketing and community
 - Continue marketing and PR activities.
 - Continue the engagement with the Silta community.
 - Continue the development and distribution of educational material.
- Partnerships
 - Continue building the borrower pipeline
 - Engage with international financial institutions (IFIs) on staple financing.
 - Develop relationships with relevant protocols and third parties.

7. Future opportunities

There are interesting opportunities to grow and expand the Silta solution from its primary role as a DeFi lending bridge for real-world assets. Possible avenues for further development include the following:

- **Integration of smart contract technology to processing cash flows.** In a toll road project, for instance, users could pay for road access and for service facilities using a stablecoin. The payments would then automatically be allocated by a smart contract to repay debt to a Silta loan pool. Profits could be distributed automatically to the project company, therefore removing the need for intermediaries and reducing transaction costs.
- **Supporting unsolicited proposals for new public infrastructure projects.** The co-founders of Silta have collectively developed dozens of infrastructure projects on behalf of governments and the private sector throughout the world. Leveraging this experience, the Silta team can develop studies on new public infrastructure projects and pitch them to the Silta community for the common good. Likewise, members of the Silta community can raise proposals for the Silta team for public infrastructure projects at specific locations⁴¹. Such a proposal might involve, for example, a new highway connecting two remote villages to enable faster transportation of goods, or a new renewable energy plant to replace an existing fossil fuel power station.
- **Supporting stapled finance.** With its background in project finance, the Silta team can work with governments and international agencies and institutions (World Bank, Asian Development Bank, etc.) in offering stapled finance on infrastructure projects. This is a model where a package of re-arranged financing is offered to potential bidders for the project. Once the bidding process reaches its conclusion, the successful bidder has the option of either taking up the financing package or using other (but typically more expensive forms) of funding.

The above ideas are only examples, of course; the community may end up raising and approving different proposals. The future development of the Silta solution is something which falls under the community's decision-making powers.

⁴¹ This kind of new capability would play well together with the existing PPP procurement models, where there are mechanisms in place for the private sector to raise unsolicited proposals for new projects.

8. The team

Ben Sheppard

Co-founder and CEO



Ben is a serial entrepreneur and founder of companies in blockchain technology, PPP infrastructure law and civil engineering industries. With 12 years of experience in PPP, he has led and structured major private finance transactions in excess of 9 billion US\$ in multiple sectors and countries. Ben has now been over 4 years in the blockchain industry, first as the Head of Partnerships for the Streamr project and most recently as the MD of TX Tomorrow Explored, a Web 3.0 consulting company.

Risto Karjalainen

Co-founder and CFO



Risto is a finance professional with a Ph.D. from the Wharton School. He's a quant with a long international career in systematic trading and institutional asset management at JP Morgan, Merrill Lynch, and well-known hedge funds in London. Risto is the chairman and CFO of Silta and a co-founder of the Streamr project. His interests include machine learning, evolutionary algorithms, behavioural finance, blockchain technology, and fintech in general.

Michael Malka

Co-founder and CTO



Michael has over 20 years of experience in the software industry. He has co-founded three companies and has worked in various roles from developer and specialist to CEO. Michael's most recent role is the CTO of TX Tomorrow Explored, a Web 3.0 software consulting company. Relevant projects include building financial products to help unbanked individuals access to DeFi microfinance. His interests include blockchain technology and artificial Intelligence.

James Cook

Co-founder and Non-executive Director



James has been involved in PPP and project finance transactions for the past 19 years. He brings in significant commercial and financing experience having served as a developer, investor, financial and technical advisor on numerous infrastructure transactions. James joined Tribe Infrastructure Group in Abu Dhabi in 2014, has advised on a number of notable transactions in the Gulf region, and is currently the Head of Tribe Advisory.

Stanley Boots

Co-founder and Chief Legal Officer



Stanley brings in 22 years of legal experience with a specialisation in PPPs, renewable energy and infrastructure development. In 2014 he co-founded Frontier Law & Advisory, a PPP and infrastructure advisory business with Ben Sheppard. He is a well-known voice in PPP development in Vietnam and Southeast Asia. Stanley has more recently gained attention for his award-winning 7 Bridges Brewing Company and for bringing craft beer into the metaverse world with beer NFTs.

Laura Tuppurainen

Head of marketing



Laura is a creative marketer with extensive experience in B2B marketing and digital services. Laura holds an MSc in Marketing from Aalto University and professional experience spanning from the international marketing of a global corporation to working with a portfolio of client projects in a digital agency. Most recently Laura has been working in the blockchain space, leading the marketing for TX – Tomorrow Explored, a Web 3.0 consulting company.

Irina Karagyaur

Head of growth



Irina has over 10 years of international business development expertise as Head of Metaverse Growth at Unique Network, Polkadot Head Ambassador for Western Europe, Regional Co-Chair to FIBREE (Foundation for International Blockchain and Real Estate Expertise) and a Chairperson for Global Council for The Promotion of International Trade, SDGs Global Impact Startups GCPIT UK. She is a co-founder of Design B2C, a crypto fintech boutique advisory with a focus on DeFi, Web 3.0 services. Irina is also experienced in NFT's and real estate tokenization.

Heikki Vääntinen

Strategic advisor



Heikki is a co-founder of API3, a DAO-governed oracle project which is building API-connectivity to Web 3.0. He is a veteran of the blockchain space with a decade of experience in business development and marketing. Heikki is passionate about connecting the real world and the decentralized web.

Jay Kurahashi-Sofue

Strategic advisor



Jay is a well-known voice in the crypto space as the VP of Marketing at Ava Labs, a blockchain organisation building Avalanche. He has led the marketing efforts at Fluidity and AirSwap and was a strategist at Ogilvy, where he co-founded its first blockchain marketing group. Jay is also the co-founder of BlockMarketers, a virtual and in-person community for marketing executives in the blockchain industry.

Beryl Chavez Li

Strategic advisor



Beryl is the co-founder of Yield Guild Games. Her experience includes founding the asset token platform CapchainX, being Entrepreneur in Residence at Coins.ph, backtesting FX trading algorithms at BlackRock London and authoring the Philippine Roadmap for Digital Startups. Beryl's career started in early-stage Venture Capital in Shanghai in 2012. She is an advisor at UnionBank PH, and holds a Master of Finance degree from Cambridge University.

Peter Lembrechts

Strategic advisor



Peter is Head of Concessions & Assets, Strategy & Transformation in the Middle East for BESIX, a major construction group globally. Since 2014, he has been building an effective business structure and his team has become a flagship for BESIX's diversification strategy. Peter has extensive experience in the development, negotiation and implementation of PPP projects, and he's been able to implement business models that make waste a valuable resource instead of a problem.

Jan Van Schoonhoven

Strategic advisor



Jan is a principal advisor at the European Bank for Reconstruction and Development (EBRD) with a focus on sustainable infrastructure. He has over 15 years of experience in the management of public-private partnerships in roads, water and social sector, and has worked on numerous projects within the EU and in emerging markets. Peter started his project finance career as the Director of the PPP Unit of the Netherlands, and has worked extensively with institutions such as the European Investment Bank (EIB), United Nations and the World Bank.

Henri Pihkala

Strategic advisor



Henri is a software engineer, a serial entrepreneur, and ex algorithmic trader. He has led the development of two high-frequency algorithmic trading applications and designed and managed building the distributed Streamr cloud analytics platform. Henri is passionate about complex architecture, scalability, usability, and the blockchain. He is a co-founder and the CEO of Streamr Network AG.

Nikke Nylund

Strategic advisor



Nikke is a former low latency algorithmic trading strategist. He's got some 20 years of managerial and entrepreneurial experience as a founder and/or serial investor in ICT and tech companies with several successful exits under his belt. Nikke holds a BSc in Finance and Entrepreneurship from the Helsinki School of Economics. He is a co-founder and the head of business development of Streamr Network AG.

TX Tomorrow Explored

TX – Tomorrow Explored is an advisory and software development company specialising in engineering data economies through the application of blockchain technology and decentralized data. We are making technologies of tomorrow accessible for clients today. Our goal is to develop solutions that truly empower industries, organisations and people by unlocking the value of data. To learn more, visit tx.company.

Streamr Network AG

Streamr is working on the real-time data protocol of the decentralized web. This includes a scalable, low-latency and secure P2P Network for data delivery and exchange. As part of the vision, Streamr is working on a real-time data marketplace and a data union framework. Functional versions of each component exist today, with full decentralization being the project's goal. The project was initiated by real-time data veterans with backgrounds in algorithmic trading and finance markets. Streamr is being built by contributors from around the world and was crowdfunded in an ICO with CHF 30 million in 2017. To learn more, visit streamr.network. You can follow Streamr on Twitter, Reddit and Telegram.

Frontier Law and Advisory

Bold.Relevant.Disruptive — that's Frontier. Founded as a boutique law and advisory firm in 2014, Frontier pursues unique challenges that require *creative intelligence*, instead of business-as-usual, canned answers. The Frontier team works across jurisdictions to apply PPP fundamentals to new project types. As an example, the firm developed a novel data traceability business model for fisheries, aimed to deliver long term sustainability fish stocks with livelihood improvements for the poorest fishers in developing countries. This is a model which is being presently pursued by USAID and others. To learn more, visit www.bold-frontier.com.