Circle StableFX:
Institutional-Grade Stablecoin FX, OnChain

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Abstract

StableFX is an institutional-grade stablecoin FX engine on Arc, enabling institutions to access and settle select stablecoin currency pairs 24/7 with competitive rates, reduced counterparty risk, and onchain settlement. It mitigates bilateral risk and delivers programmable, auditable, and always-on cross-currency conversion for global payments, treasury, and digital asset flows

1. Introduction

Foreign exchange (FX) is the world's largest financial market, with average daily turnover exceeding $9.6 trillion[1]. Despite this immense scale, the infrastructure that powers FX is still rooted in legacy practices: batch processing, correspondent banking chains, and bilateral credit agreements. Settlement remains the biggest bottleneck - for everyone except the largest institutions, it is costly, slow, and operationally fragile. Cut-off times, T+1/T+2 settlement windows, and long chains of intermediaries add latency and opaque fees. Between mismatched operating hours and multi-jurisdiction processes, settlement risk persists—the classic "deliver my leg; wait; hope you deliver yours" problem. Payment-versus-payment (PvP) is a settlement mechanism that ensures that the final settlement of a payment in one currency occurs if and only if the final settlement of a payment in another currency or currencies takes place[2]. PvP arrangements like Continuous Linked Settlement (CLS) have reduced settlement risk for top-tier currencies, but their reach is limited: CLS covers just 18 currencies, is directly accessible only to the largest wholesale dealers, and still leaves 31% or ~$2.2 trillion in daily flows exposed3. In the absence of PvP arrangements, businesses have to negotiate a complex web of bilateral relationships and underwrite counterparties in order to mitigate, if not fully address, these risks[2].

Furthermore, the costs of correspondent banking are enormous. Estimates suggest roughly $27 trillion sits idle in nostro/vostro accounts globally to support pre-funding of FX transactions[4]. Cross-border flows account for only 17% of global payments by volume, yet make up 27% of all transaction fees, equivalent to around $200 billion per year[5]. Emerging-market participants face even higher barriers as correspondent networks shrink and costs rise. In parallel, market structure has become more fragmented with liquidity spread across multiple gated venues. During volatility,

these gaps widen, and reliance on a handful of dealers amplifies systemic stress.

Over the last decade, a parallel system has emerged: fiat-backed stablecoins that can move across borders in seconds, 24/7/365. Onchain settlement is always on, auditable, and programmable. Yet until now, institutions lacked a solution that combined the strengths of modern blockchain settlement with the execution quality, risk management, privacy, and compliance they expect from enterprise FX.

StableFX addresses these challenges. It is a stablecoin FX engine that integrates institutional Request for Quote (RFQ) execution with automated payment-versus-payment (PvP) settlement directly between institutions, leveraging trusted stablecoins on Arc, an open Layer-1 blockchain purpose-built to unite onchain innovation with real-world economic activity. StableFX enables businesses around the world to access aggregated, on-demand 24/7 stablecoin FX liquidity without having to manage bilateral settlement risk with multiple counterparties, without having to deal with T+1/T+2 settlement windows, and without needing to maintain large prefunded balances, relying instead on just-in-time liquidity.

StableFX turns cross-currency stablecoin conversion into a programmable utility capable of being embedded directly in payments, treasury operations, and on/off-ramp flows, resulting in tight quotes from competitive market makers, settlement enforced onchain, and end-to-end workflows that run any hour of any day with immutable transaction records.

This litepaper details the StableFX architecture, highlighting its solutions to current FX market inefficiencies. It further explores real-world applications across corporate treasury, B2B/B2C payments, and fiat-to-digital asset conversion. Finally, it outlines the strategic roadmap for StableFX, encompassing expanded execution models, additional asset classes, Arc's privacy features, and deeper integration within the Circle platform.

2. Core Architecture for StableFX

StableFX operates as a modular system, where each subsystem contributes independently and synergistically to its overall functionality. Key components include the Execution Engine, designed to optimize price discovery by aggregating demand and supply and the onchain Settlement Contract, which reduces settlement risk and enables secure delivery. Complementing these core components, the Circle Partner Stablecoins program provides support for third party issuers of regional stablecoins, expanding the range of currencies available in StableFX.

To begin with, participation is permissioned: only Circle whitelisted makers and takers can access StableFX. These permissioning controls preserve market integrity and mitigate execution risk while also removing the need for bilateral relationships.

2.1 Execution Engine

On the surface, StableFX operates like an institutional trading engine. A taker— for

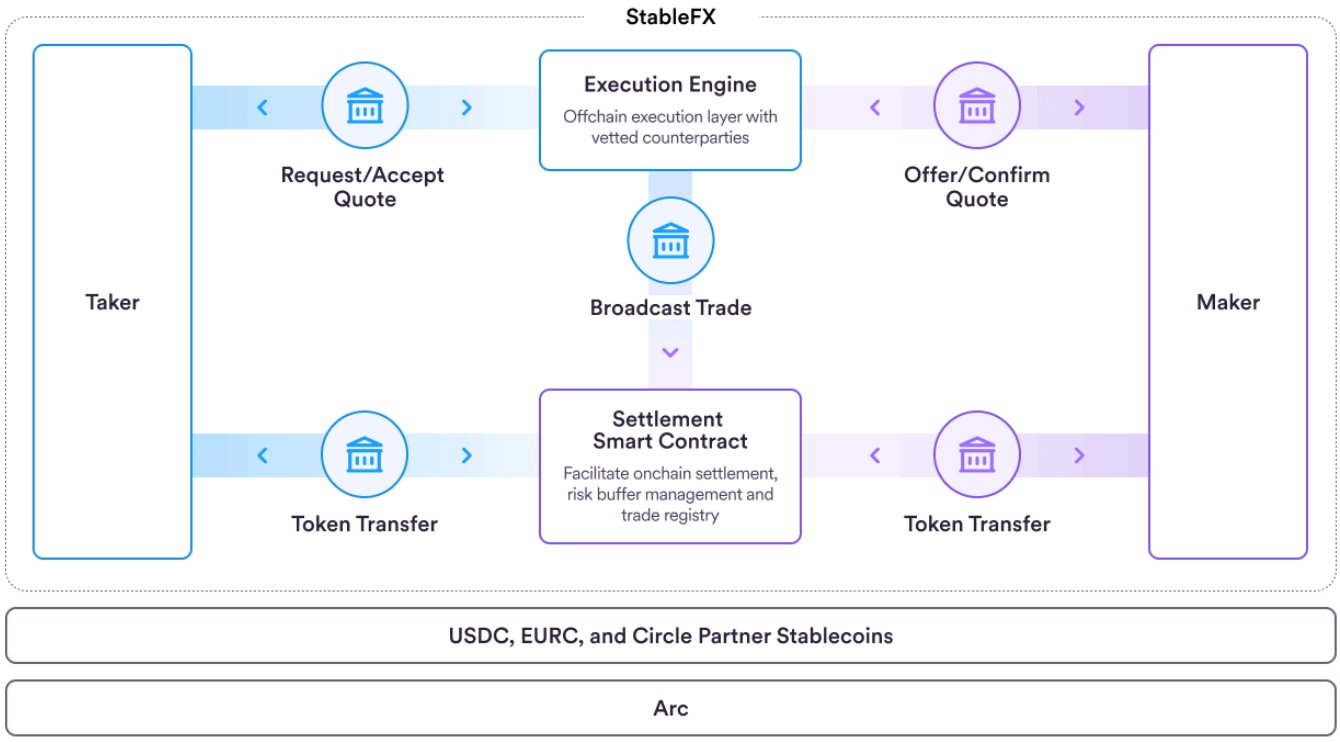

Figure 1: The architecture of StableFX.

example, a corporate treasury, crypto VASP, or payment service providers (PSPs) —submits an RFQ specifying currency pair, side, notional, settlement tenor, and preferred settlement model. StableFX validates the request and broadcasts it to eligible makers over low-latency channels. Makers — for example, crypto OTC desks — return quotes based on their inventory and risk policies. StableFX presents the quotes to the taker, and on taker and maker acceptance the execution is immutably recorded on Arc. StableFX decouples execution from settlement: quotes flow offchain for speed; but execution records and PvP settlement are enforced onchain that all participants see the same canonical record.

RFQ enables makers to control size and risk exposure, while takers obtain pricing without the same levels of slippage and fragmentation inherent in automated market maker (AMM) and central limit order book (CLOB) based systems. Operational targets are sub-100 ms for quote round-trip and sub-200 ms for execution latency. This is exclusive of any latency originating from our partners (takers or makers). This combined with the flexibility for takers to customize quote validity and settlement tenors means StableFX can be embedded "in the loop" of end-user experiences such as remittances, payroll or e-commerce checkout.

StableFX helps maximize liquidity depth by consolidating access to supply from multiple makers. Integration with StableFX is made seamless through standardized APIs and tooling that will be familiar from the offchain world. This will enable more makers to

seamlessly integrate with StableFX boosting liquidity and coverage for stable pairs.

2.2 OnChain PvP Settlement Contract

Execution is only half the story; settlement is where risk often hides. StableFX mitigates it through a PvP escrow smart contract, ensuring funds move only when both sides deliver. Settlement windows are configurable pre-trade, ranging from near-instant to end-of-day or beyond, and trades only settle when both counterparties have funded before expiry.

The contract facilitates settlement. If obligations are not met, trades unwind and funds revert. Maker netting collapses gross obligations into net positions, increasing capital efficiency while retaining PvP safety. This replicates best-practice settlement discipline in programmable form. This mitigation of settlement risk is what allows Makers and Takers to transact over StableFX without the onerous burden of risk managing multiple bilateral relationships under traditional models.

Thanks to Arc's deterministic finality, confirmed transactions cannot be re-ordered or reversed. Fees are denominated in the stablecoins being traded, making gas and settlement costs more predictable.

Deferred settlement adds efficiency only if exposures are governed. StableFX continuously tracks unsettled positions by counterparty, pair, and tenor. Makers and takers can determine when and how much pre-funding needs to be delivered prior to execution. Once agreed upon, the rules and conditions for liquidation are encoded in the smart contract. If delivery fails, trades are voided, pre-funding is released, and the defaulting party may be suspended from StableFX. This mirrors the protections of central clearing but enforced bilaterally via smart contracts. These controls activate only in deferred settlement models; with immediate settlement requiring no pre-funding.

2.3 Circle Partner Stablecoins

Global reach requires trusted local assets. StableFX integrates select fiat-backed stablecoins via the Circle Partner Stablecoins program. This is Circle's structured onboarding and support initiative for local stablecoin issuers who meet strict eligibility criteria, bringing only select issuers to anchor FX corridors.

Issuers admitted to Circle Partner Stablecoins must satisfy Circle's eligibility framework, covering regulatory licensing, reserve quality and transparency, operational maturity, security, and market access. Mint/burn flows must be automated on Arc, reserves must be 1:1 backed by HQLAs and attested, and issuers must demonstrate compliance and local banking connectivity. Partners are required to complete ongoing monitoring, including quarterly attestations, sanctions screening, and trigger-based reviews for regulatory or reputational events.

Circle Partner Stablecoins, together with the Execution Engine and PvP Settlement Contract, enhances network trust, enables predictable settlement, and promotes

transparency, security, and regulatory best practices.

3. Use Cases

StableFX is designed for flows that touch the real economy, where stablecoin FX is a means to an end rather than a speculative activity. Below are examples of how programmable, always-on stablecoin FX reshapes corporate treasury, payments, and digital asset ramps.

3.1 Corporate Treasury Management

Just-in-time sweeps. A multinational accumulates weekend EUR receipts. Historically, treasury either pre-trades on Friday (bearing FX risk) or waits until Monday (bearing working-capital drag). With StableFX, the company automates a Saturday sweep: EURC→USDC conversion at the selected quote, settled atomically, and ready to be redeployed into investments or USD obligations. No cut-offs, no idle balances, and audit-ready receipts.

Hedging operational exposures. A SaaS platform bills in local currencies but reports in USD. StableFX enables programmatic conversion of daily receipts into USDC at set windows, with spreads and fill rates analyzed over time to refine policy. Treasury tightens controls and reduces cost of funds without new headcount.

3.2 B2B and B2C Payments

Embedded FX in payroll. A marketplace pays gig workers across multiple countries. Instead of maintaining prefunded balances in each currency, it holds USDC and uses StableFX to convert at payout. From there, the marketplace can deliver funds near-instantly in stablecoins; enabling recipients to cash out through local partners. The marketplace receives consolidated stablecoin FX reports, which they could tie to payout IDs, easing reconciliation.

Supplier settlements. A manufacturer paying a European supplier every Saturday can invoke StableFX to swap USDC→EURC moments before a SEPA off-ramp. Immutable settlement receipts reduce disputes about timing and accelerate payables.

Remittances. Providers can source corridor-specific quotes via StableFX and pass competitive rates to end users. Competition among makers compresses spreads. PvP settlement means providers avoid warehousing risk between collection and disbursement. Low Arc fees enable workable economics even for small tickets.

3.3 On and Off Ramps

Multi-currency onboarding. A European customer wants to purchase USDC by funding EUR from a SEPA enabled bank account via a business banking app. The app mints EURC, invokes StableFX for EURC→USDC conversion, and delivers USDC to the wallet. No USD detour, no hidden bank spread, and a clear onchain receipt.

Cash-out. A UK user wants GBP from USDC obtained from crypto trading. The third-party trading app integrates into StableFX to convert USDC→GBP stablecoin, which the user redeems locally. The third-party trading app can serve local currency conversion demand

and the user gets access to efficient onchain FX.

Exchange liquidity management. A crypto exchange balances EUR and USD books via StableFX rather than maintaining large pools of fiat. Programmatic RFQs reduce trapped capital and shorten funding cycles.

4. Future Vision and Roadmap

StableFX launches with RFQ, but its architecture anticipates expansion across execution styles, assets, and privacy models.

4.1 Privacy on Arc

Privacy is especially critical in FX markets, where revealing trading intentions or counterparties can distort prices and expose participants to predatory behavior. Large corporate and financial institutions often prefer to keep the size and timing of currency flows confidential to avoid moving the market against themselves. Similarly, liquidity providers need assurance that their quoting activity will not be mined for signals by competitors to undercut prices.

Arc's roadmap includes privacy features such as confidential transfers that StableFX can leverage to encrypt certain sensitive information so that they are designed to be shielded from public view[6]. Arc's approach to privacy features is designed to support institutional compliance programs and opt-in features such as "view keys" to allow selective disclosure to auditors or regulators. By embedding privacy at the blockchain layer, StableFX is designed to protect sensitive commercial information from adverse actors while still supporting compliance functions, and allowing regulators and auditors to access records when required. This balance of confidentiality and auditability is essential for institutional adoption of onchain FX.

4.2 Beyond RFQ

In today's FX markets, execution styles differ by participant and instrument. BIS and market structure research show that 60–70% of buy-side flow is executed via RFQ or Request for Stream (RFS) channels, reflecting their dominance in FX markets. Algorithmic execution (TWAP, VWAP, POV) accounts for roughly 15–20% of flow in the most liquid pairs, typically layered on top of RFQ pipes rather than replacing them. This breakdown underscores why StableFX begins with RFQ, where most institutional demand sits, but also how StableFX evolves to support the full spectrum of execution preferences and bring the benefits of PvP settlement and replacement of bilateral relationships to a broader set of customers and flows.

4.3 Tokenised Assets

In the future, StableFX may support more asset classes:

Treasuries and MMFs. StableFX could enable conversion into tokenised cash equivalents (such as USYC) intra-day. Corporates could rotate USDC into tokenised Treasuries, then back before payroll.

Deposit tokens. As regulated digital monies proliferate, StableFX could bridge them with stablecoins and tokenised assets under the same settlement discipline.

Tokenised RWAs. As more and more assets get tokenised, StableFX could enable seamless institutional exchange of these assets against stablecoins unlocking PvP settlement for a whole new set of asset classes.

4.4 Enabling Permissionless Taker Demand

Today, StableFX is gated to whitelisted institutional participants, but over time, access could be expanded to include permissionless takers for willing makers—wallets and applications able to request quotes without pre-approval. This would unlock broader ecosystem participation, including retail aggregators, wallets, and onchain dApps, while maintaining risk controls at the maker and settlement layers. Enabling permissionless takers expands liquidity reach, creates new FX use cases in DeFi and commerce, and aligns StableFX with the open internet ethos of stablecoins—accessible, programmable, and global.

5. Conclusion

StableFX delivers what institutions require — competitive pricing with low slippage, deterministic settlement, risk controls, and programmability—while reducing what they do not: delays, reconciliation errors, bilateral gatekeeping. Anchoring execution and settlement to Arc's deterministic ledger and embedding into Circle's rails makes FX programmable: always on, auditable, and composable.

For makers, StableFX aggregates institutional flow, enables capital-efficient settlement windows with netting and removes bilateral dependencies. For issuers, it provides FX utility for their stablecoins and integration into global enterprise workflows. For takers, it offers aggregated liquidity, 24/7 onchain settlement, improved risk management and streamlined workflows. As StableFX expands— new execution models alongside RFQ, tokenised assets, forthcoming Arc privacy features, and permissionless demand—it evolves into a universal programmable value-exchange layer.

The trajectory of finance is clear: money movement is becoming internet-native. StableFX is built for that reality, bringing PvP safety and sub-second finality to currency exchange. When FX behaves like software, treasurers manage tighter cash cycles, platforms scale globally without prefunding drag, and end users receive value in their chosen currency—reliably, quickly, and at transparent rates.

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