

SIREN 

TOKEN ECONOMICS PAPER

August 2024





SIREN

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SIREN



ABSTRACT



ABSTRACT

Decentralized finance (DeFi) has opened new avenues for financial innovation, yet sustainability remains a critical challenge for many protocols. This paper focuses on the Siren protocol and its governance token SIREN, which introduces a pioneering model in tokenomics designed for longevity and self-sustainability. By integrating dynamic consumer-specific pricing (CSP) strategies, Siren not only enhances user engagement through personalized financial tools but also optimizes protocol revenue. This approach ensures that the ecosystem can perpetually fund its operations and development, creating a robust, transparent, and equitable options market. We explore how Siren's tokenomics framework reduces the traditional high costs associated with options trading, increases market transparency, and fosters an environment where both traders and the protocol can thrive indefinitely.

SIREN



INTRODUCTION



INTRODUCTION

Token economics is a term used to describe how a digital asset is utilized and flows through a protocol. Best practices for the economic designs of decentralized protocols are constantly evolving. The token design for the Siren protocol is similarly evolving in order to ensure that Siren's related decentralized autonomous organization (DAO) is given all the tools necessary to maintain an efficient and resilient platform. This paper lays the groundwork for the SIREN token and details the initial parameterized tools at the disposal of the Siren DAO.

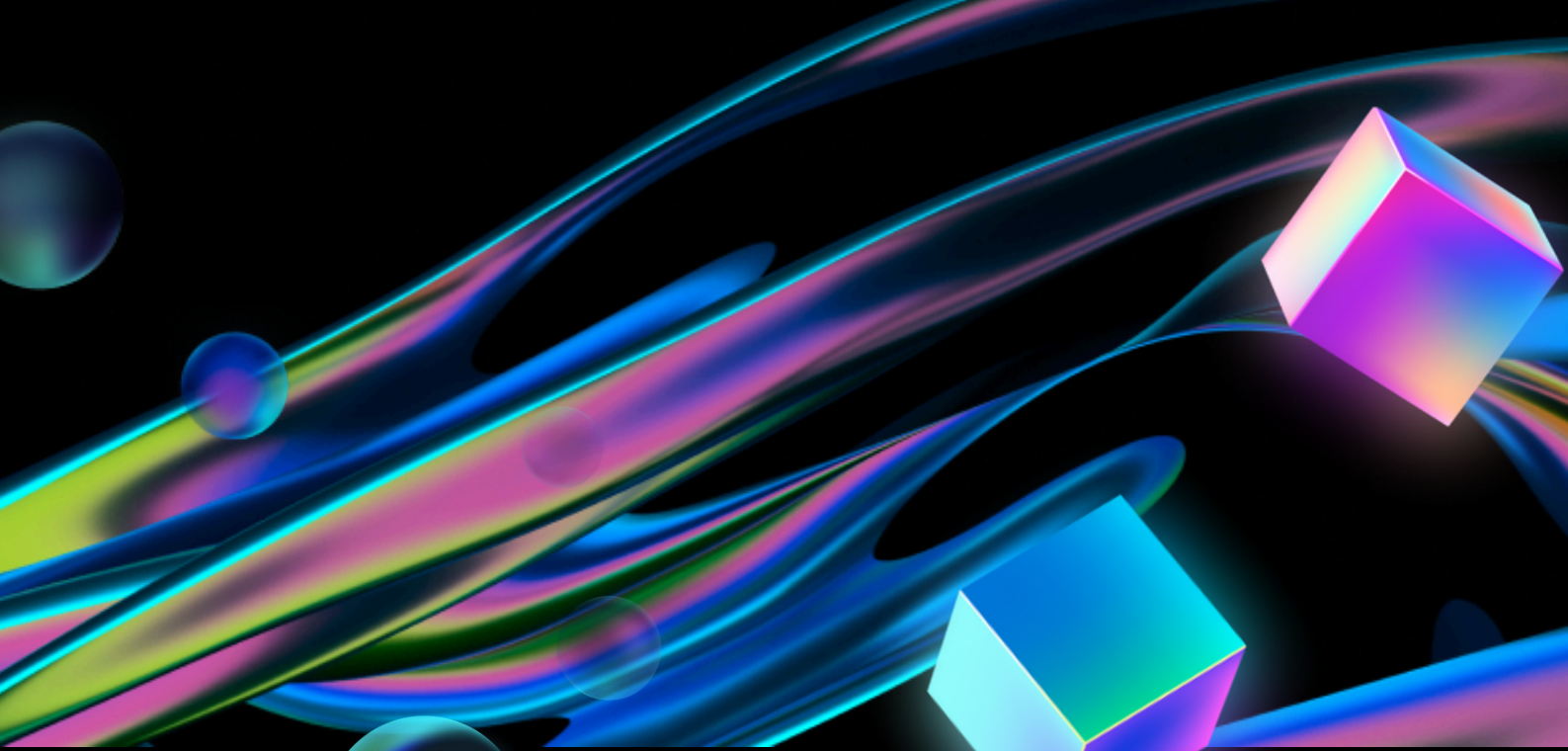
Siren is a decentralized protocol for creating, trading, and redeeming options contracts for digital assets. In the ever-evolving landscape of financial markets, options trading stands out as a crucial instrument for speculation, hedging, and strategic investment. Traditional options markets, however, often come with significant barriers-to-entry, such as: high costs, lack of transparency, few available markets, and limited accessibility. These challenges create an uneven playing field, favoring large, institutional investors over smaller, individual participants. This effectively prevents participation from users who lack sizable capital.

The advent of decentralized finance (DeFi) has paved the way for innovative solutions to these problems in other verticals but has yet to gain significant traction in the options space. Democratizing access to options enables greater participation in the economic system, introducing traders to better methods of risk management and diversification.



Siren differentiates itself in the decentralized options market by dynamically optimizing incentives based on participant profiles while simultaneously maximizing the amount of revenue earned by the protocol. This innovative approach not only addresses the inefficiencies of traditional markets but also creates a self-sustaining ecosystem that can adapt to market conditions and thrive over time.

With its commitment to security, transparency, and inclusivity, the Siren protocol provides traders with a robust platform where they can engage in options trading without the need for intermediaries. By empowering individuals with greater control and access to sophisticated financial instruments, Siren is poised to transform the landscape of options trading and contribute to the broader adoption and proliferation of decentralized finance.



SIREN OBJECTIVE





SIREN OBJECTIVE

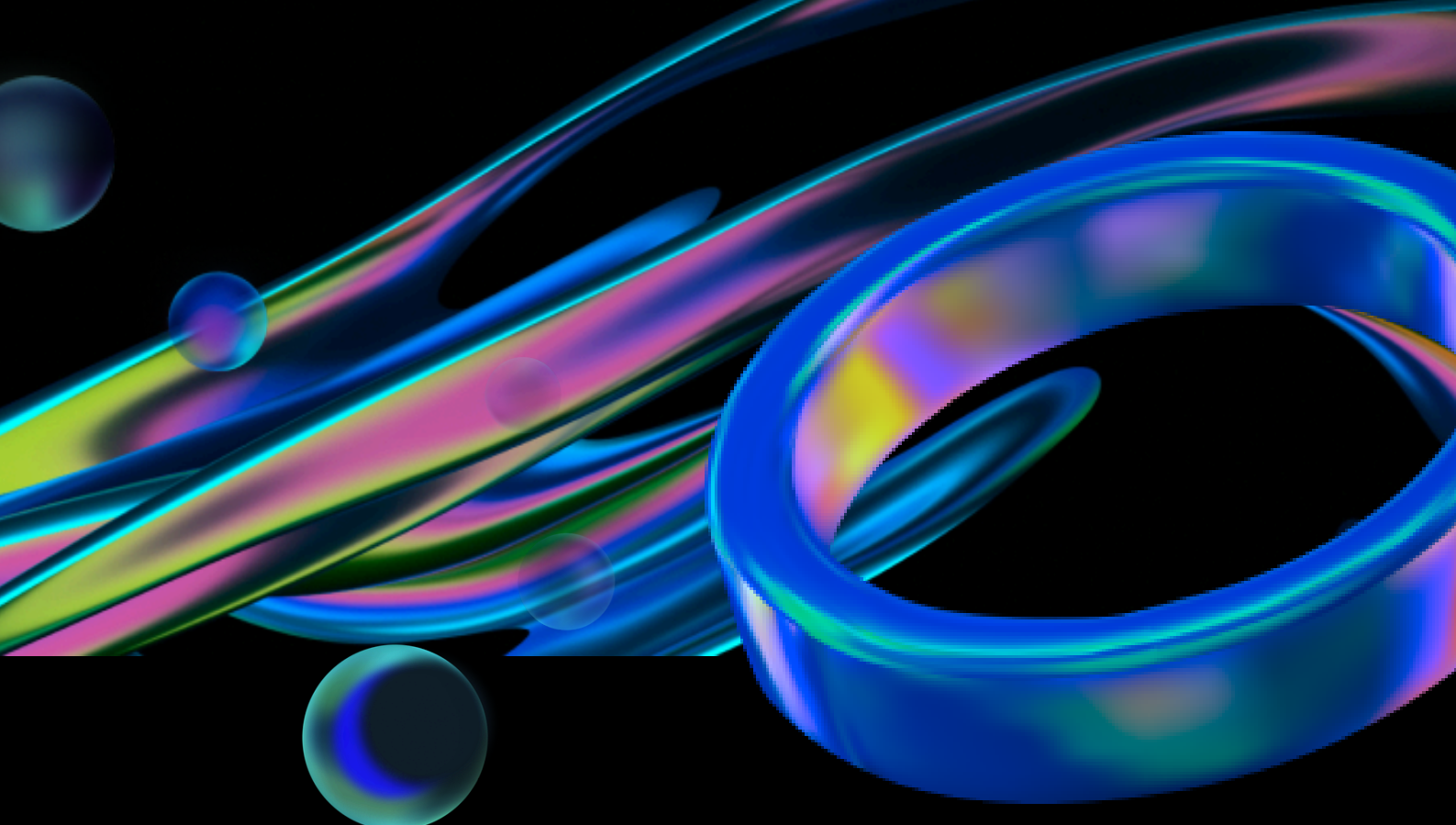
Siren aims to deliver a trading experience on par with centralized exchanges (CEX), while still offering the familiar benefits of self-custody that are inherent to DeFi.

In order to achieve this, Siren is structured as a two-sided marketplace consisting of:

1. A capital-efficient system for pooling liquidity that generates yield for the protocol and Liquidity Providers (LPs) by facilitating trading, and
2. A protocol that automates the entire lifecycle of options trading and settlement,

Furthermore, this enables users to permissionlessly trade and speculate on digital derivatives in a peer-to-peer (P2P) manner without requiring a directly-involved participant. Additionally, Siren's code includes a protocol that automates the entire lifecycle of options trading and settlement, resulting in competitively-priced markets across a wide range of assets. By using on-chain liquidity and settlement, there is no point at which positions are not properly owned and operating. The use of offchain quotes and tracking enable a more dynamic and frictionless experience for users.

While initially enabling decentralized trading of standard options models, Siren's efficient framework can expand to include various types of options trading, including perpetual futures. As both consumer needs and interchain opportunities expand, so will Siren's reach and utility, offering tools of financial freedom to everyone.



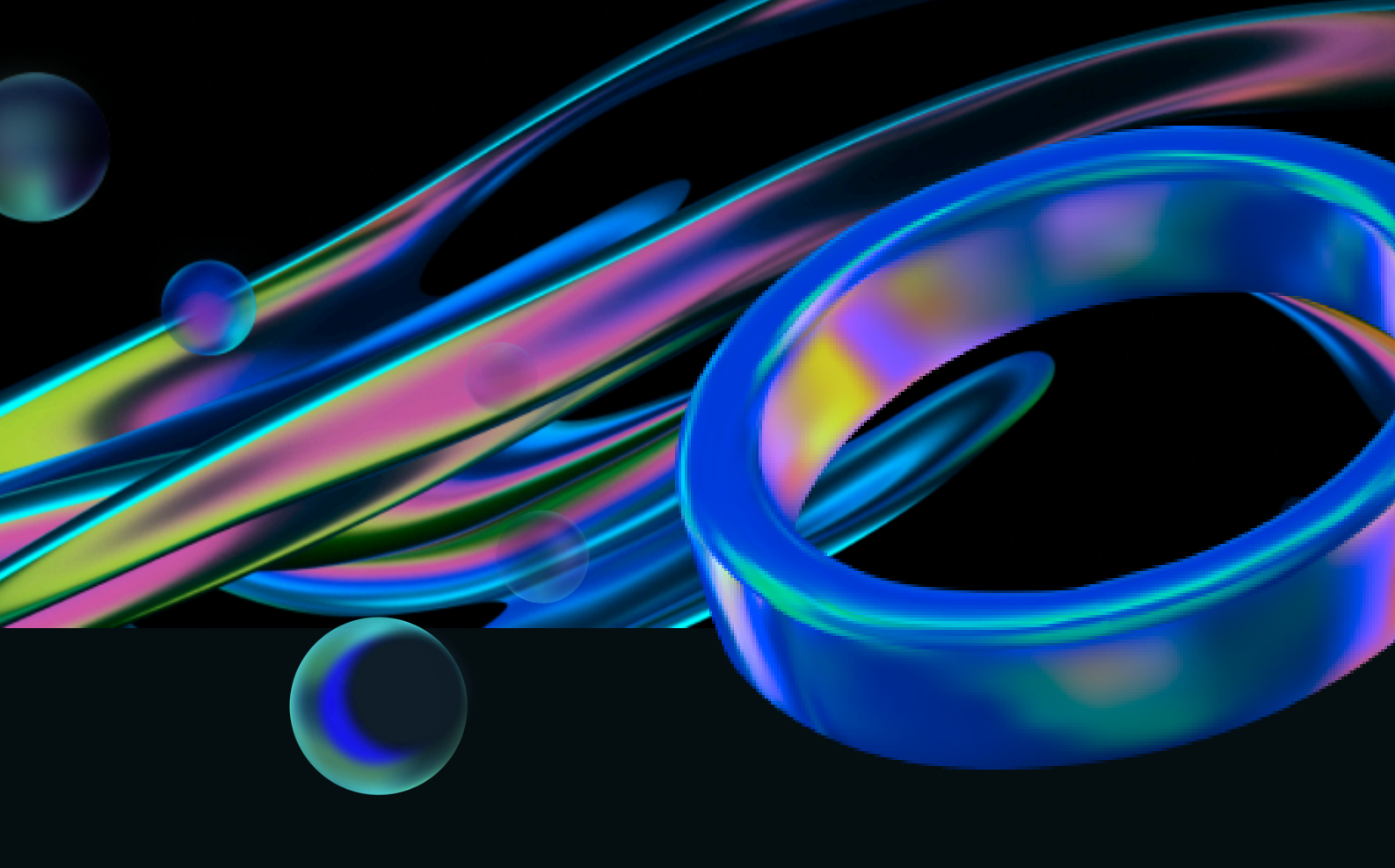
SIREN TOKEN DESIGN

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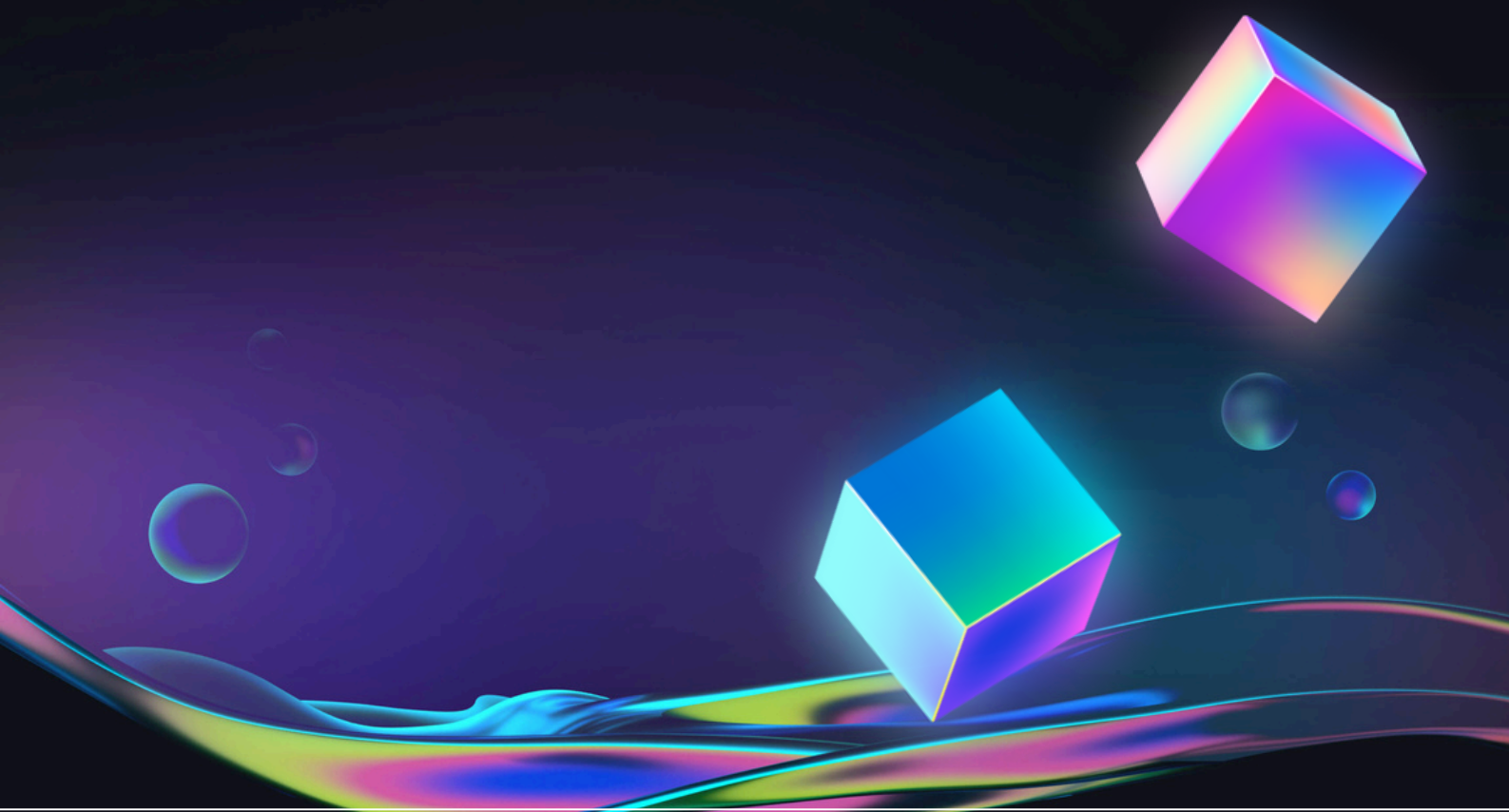
Siren Protocol's design contains multiple innovative features, both on- and off-chain, that work together to ensure that incentives are aligned and focused on furthering the expansion of the protocol. The SIREN token's key use cases center around protecting, governing, and helping the protocol grow, as Siren perpetually and sustainably becomes more decentralized.

In governance, the SIREN token will be integral in managing Treasury tokens that belong to the Community Pool and the parameters that describe how the protocol functions, such as inflation rates, fees, and rewards. Governance voters will have control over the levers that create incentives for volume, usage, and whatever other facets are deemed integral for protocol growth by the SIREN DAO.

In addition to governance, Siren will employ a robust growth-driving solution that can be easily adjusted to cater to future needs. Many forms of growth are needed, and not all future needs can be known ahead of time. One method for perpetual volume incentivization is volume incentive points (VIP), which will award inflationary rewards to traders based largely on their trade volume. Stakers will have dynamic boosts based on protocol participation in a way that aligns incentives more closely with active members of the platform rather than solely with token holders. Lastly, A limitless points initiative that encompasses more forms of growth, such as social growth and referrals, will be rolled out in epochs, and is designed to foster all forms of growth simultaneously.



I. EMISSIONS



EMISSIONS

Best practices for the economic designs of decentralized protocols are constantly evolving. Initial economic designs for DeFi protocols often limited their own success and flexibility by instituting a fixed maximum supply of tokens. Initial incentives geared to onboard users would often show extremely high APRs, which drove initial interest in older DeFi platforms, but these returns were not sustainable for projects over time.

Protocols lacked the flexibility to adjust to more pragmatic market sentiments, and many did not have proper contingency plans in place to avoid imploding. Monetary inflation serves as a mechanism to distribute funds for ongoing expenses in a decentralized manner. For example, governments may increase the money supply to finance essential services such as fire stations and welfare programs. Similarly, companies may issue additional stock to raise capital, effectively diluting ownership but enabling funding for growth.

In effect, inflation allows for the flexibility to finance necessary expenditures without relying on increased centralization or charity. Uncontrolled and unrestricted inflation, however, leads to inefficient dilutive market impacts. With economic efficiency in mind, SIREN is designed to have an inflationary rate high enough to avoid stagnation, while at the same time intentionally countering that inflation with direct supply sinks from protocol revenue.

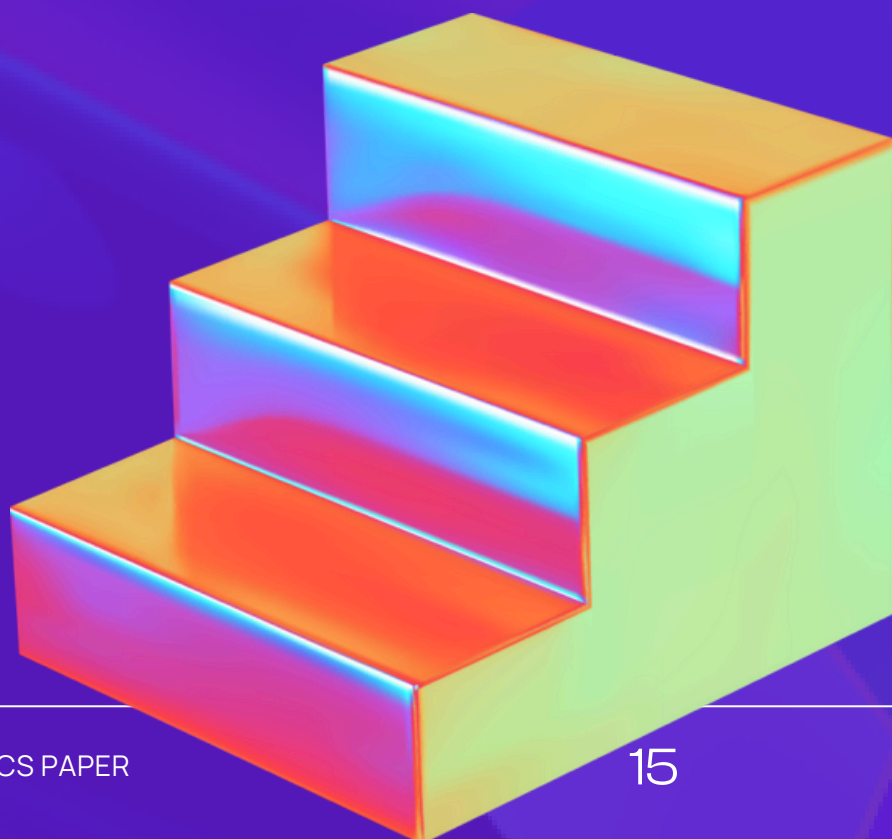
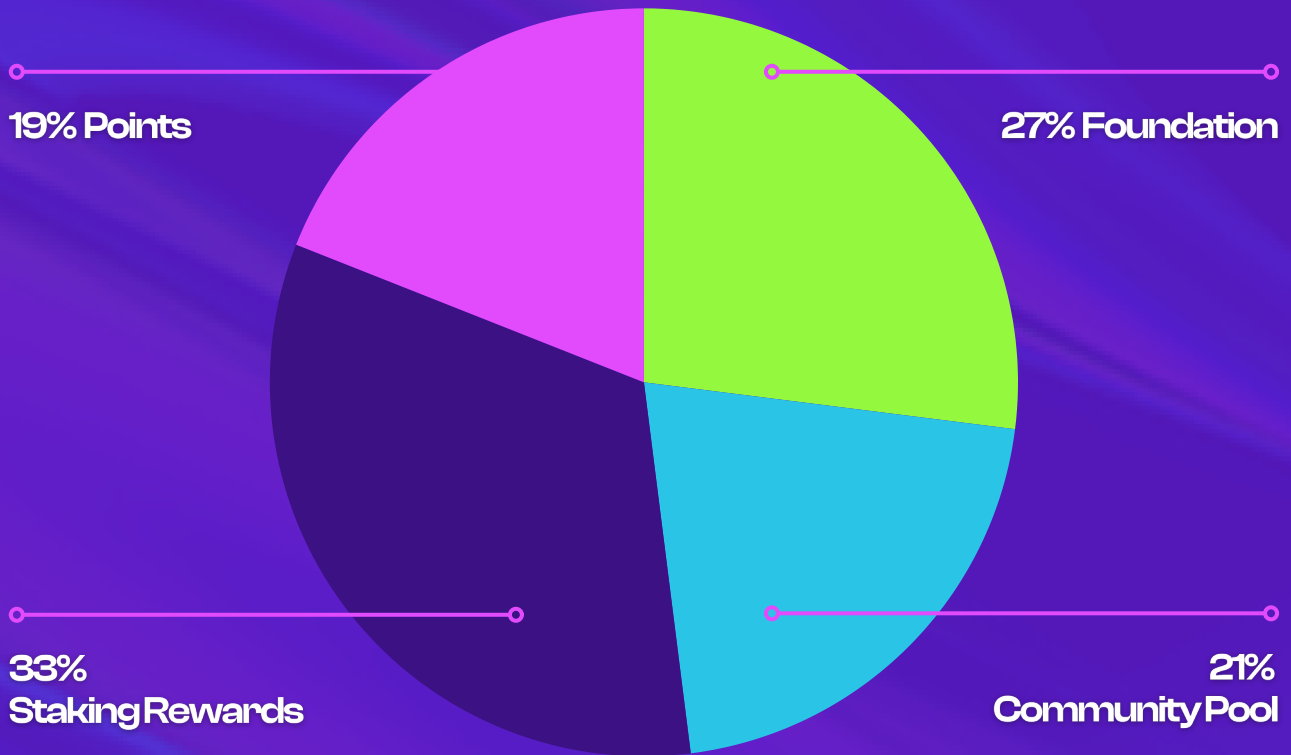
SIREN will have a parameterized emissions rate denominated as a fixed number of tokens per year, minted pro rata per block, and can be directed towards any and all users or actions that require incentivization. As the Siren protocol is used, the protocol will generate fees and a portion of those accrued fees will be used to buy back and then burn the SIREN token.

Volume on the Siren protocol and the price of the SIREN token are independent variables; the Siren protocol and/or developing team cannot control them. This leaves a dynamic supply of the SIREN token. This approach leads to a healthier and more easily-adjustable protocol compared to the plethora of early DeFi primitives that are hampered by the limitations of a maximum token supply.

The mint-rate parameter, as well as distribution percentages of emissions, are completely governable by the SIREN DAO. Initial suggestions are as follows:

		Tokens/Year
FOUNDATION	27%	16,200,000
COMMUNITY POOL	21%	12,600,000
STAKING REWARDS	33%	19,800,000
POINTS	19%	11,400,000
TOTAL	100%	60,000,000

Inflation [Max 6%]



With an initial supply of 1,000,000,000 SIREN tokens, this mint-rate (60,000,000 tokens per year) suggests an initial maximum inflation of 6% that is decreasing as total supply increases.

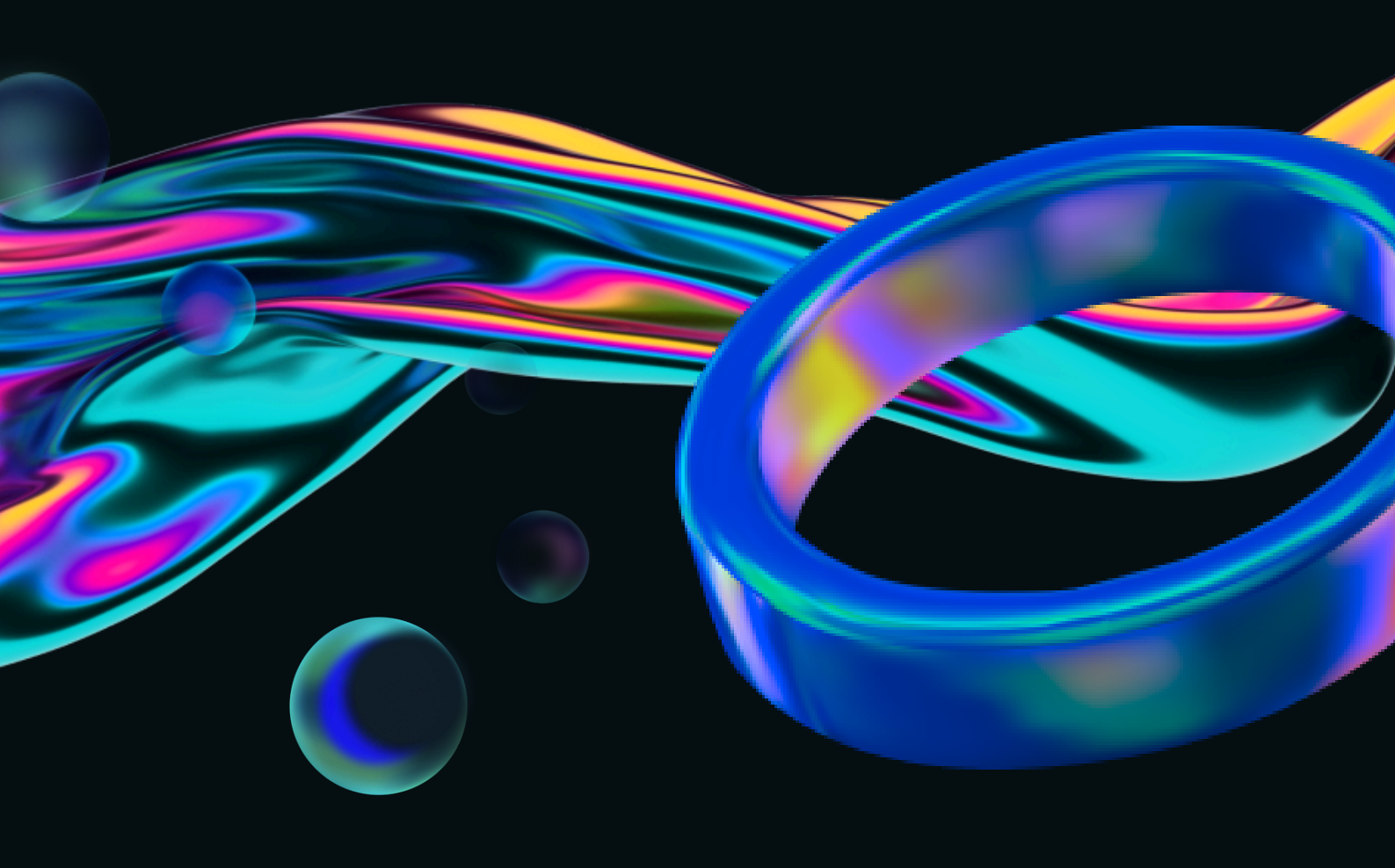
The Foundation is used for funding grants and fostering the continued growth of the protocol. Continued token issuance helps avoid the need for eventual dilutive rounds that are experienced in traditional finance. This further encourages long-term staking rather than short-term speculation in the token's value, which is a common issue encountered by protocols lacking proper, long-term strategic planning.

The Community Pool is governed by the SIREN DAO and can be allocated to any governance proposals that the community deems beneficial. Persistent emissions ensure that funds are being replaced, encouraging the community to actively use tokens to grow the ecosystem, though frugality and wisdom is always encouraged. Additionally, this system offers the community the ability to participate in the development of the protocol without being handed a blank check to spend as they wish.

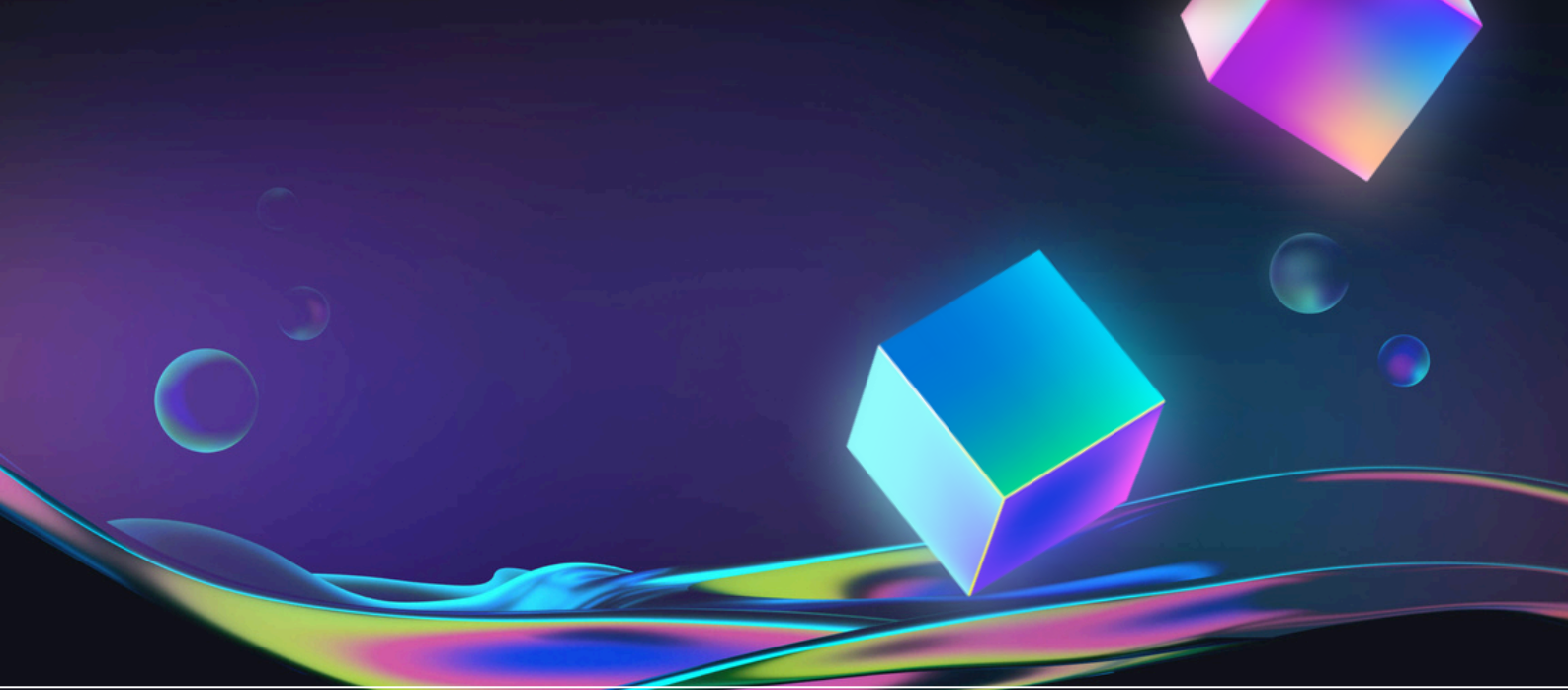
Staking rewards emissions provides a baseline staking APR for SIREN holders who lockup their tokens to participate in governance. The staking contracts will be further enumerated in the Staking section, but this will further incentivize volume, NFT sales, and general protocol usage and support. The emissions towards stakers will not make up the entirety of staking rewards, as a percentage of protocol fees will also go to stakers.

Allocations towards Points and Volume Incentive Points (VIP) will equitably provide tangible incentives towards both traders and those onboarding traders based not only on volume and consistency but any number of desired growth metrics.

All percentages and parameters are fully governed by the SIREN DAO, voted upon by SIREN stakers.



II. PROTOCOL FEES



FEES

The Siren protocol can generate various types of fees from the protocol's usage.¹ Both the specifics of fees, and how they're utilized by the protocol are parameterized and adjustable by DAO governance based on platform and ecosystem growth. In this section the handling of protocol fees based on potential initial parameters will be demonstrated.

Fee Distribution Parameters	
50%	STAKERS
40%	SIREN BURN
10%	OPERATIONS

According to these initial parameters, 90% of fees will automatically go to buying back the SIREN token, with 50% topping off the incentives allocation (see more in the Staking section) and 40% being burned forever, countering the inflationary pressure of emissions. The 10% operations allocation is in addition to 100% of NFT sales, providing the Foundation opportunities for developmental sustainability separate from reliance on selling SIREN token allocations.



III. VOLUME INCENTIVE POINTS

Example: the Siren protocol generates \$100,000 in monthly revenue, and the price of the SIREN token is fixed (arbitrarily for example's sake) at \$0.05

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Stakers: $0.50 \times \frac{\$100,000}{\$0.05} = 1,000,000$ SIREN bought, and added to 'Incentives'

Burn: $0.40 \times \frac{\$100,000}{\$0.05} = 800,000$ SIREN bought and burned, reducing the total supply

Operations: $0.10 \times \$100,000 = \$10,000$ in non-SIREN denominated income

This example suggests \$90,000 of buy-side pressure for the SIREN token, increasing APR for SIREN stakers, and a deflation rate higher than the emissions rate, leading to SIREN being net-deflationary. For more examples of revenue and supply effects, see **Appendix C**.¹

VOLUME INCENTIVE POINTS

The volume incentive points (VIP) initiative is a participation system that enables direct incentivization for volume on a weekly basis. Both traders and those who refer them to the platform earn VIP as trading occurs. Since the bulk of protocol revenue comes from platform trading volume, it makes logical sense for traders to also steer the direction of the Siren protocol. They will do this by earning the governance token, in a manner that increases rewards based upon longevity, to ensure the best value goes to frequent users.

Based on proposed initial emissions, an estimated over 217,000 SIREN tokens will be disbursed to token earners each week. The amount of VIP earned per week is an independent variable based on volume and usage metrics, and therefore the rate of SIREN/VIP redemption will vary weekly.

A simplified example:

In Week 1, Alice trades \$10,000 in volume, and Bob trades \$40,000 in volume.

Alice earns 10,000 VIP and Bob earns 40,000 VIP.

The redemption rate ($R_{\frac{S}{V}}$) for SIREN/VIP = $\frac{217,000 \text{ SIREN}}{50,000 \text{ TotalVIP}} = 4.34 \frac{\text{SIREN}}{\text{VIP}}$

Therefore, Alice would earn 43,400 SIREN, and Bob, 173,600.

In Week 2, Alice and Bob once again trade \$10,000 and \$40,000 respectively, but now, Charlie also trades \$200,000, earning 20,000 points.

$$R_{\frac{S}{P}} = \frac{217,000 SIREN}{250,000 TotalVIP} = 0.868$$

$$Alice: 10,000 VIP \times 0.868 \frac{SIREN}{VIP} = 8,680 SIREN$$

$$Bob: 40,000 VIP \times 0.868 \frac{SIREN}{VIP} = 34,720 SIREN$$

$$Charlie: 200,000 VIP \times 0.868 \frac{SIREN}{VIP} = 173,600 SIREN$$

Here you can see that between weeks 1 and 2, Alice and Bob had a massive decline in SIREN earnings as their percentage of overall platform volume decreased. The nature of this protocol ensures scalability through success but also dynamically increases the pro-rata incentives during times of lower volume.

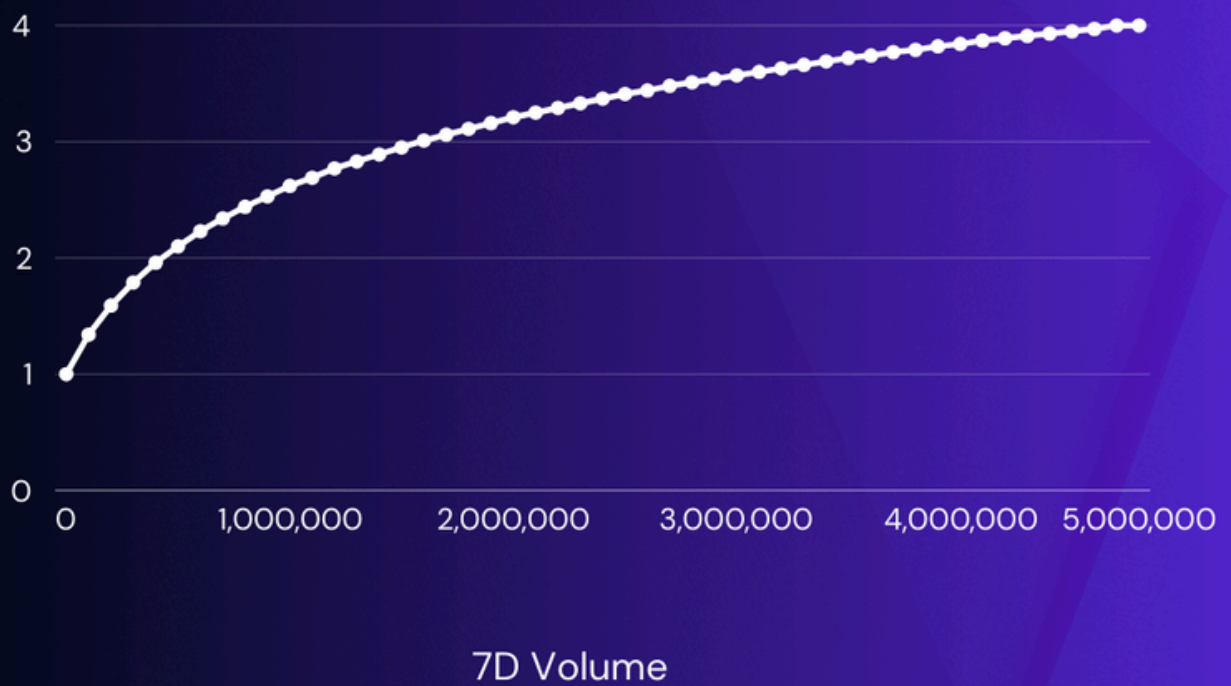
However, not all volumes will mint VIP at a 1:1 rate. With the belief that the best rates should go to the best customers, the VIP minting-rate will take into account other data, namely a trailing 7D volume weight. The formula for VIP mint-rate per dollar in volume is as follows:

$$f(x) = \left\{ \frac{4}{\ln(x + 247707)} - 11.42 \right.$$

This formula produces diminishing increased returns for continued volume. In other words: the more one trades on SIREN, the better returns they get on their volume, however, the bettering of the returns decreases as more users use the protocol.

7D Volume	VIP Mint Rate / \$
\$0	1.00
\$20,000	1.08
\$100,000	1.34
\$500,000	2.10
\$800,000	2.44
\$1,000,000	2.62
\$2,000,000	3.21
\$3,000,000	3.57
\$4,000,000	3.84
\$4,727,612	4.0
\$6,000,000	4.0

VIP MINT RATE / VOLUME



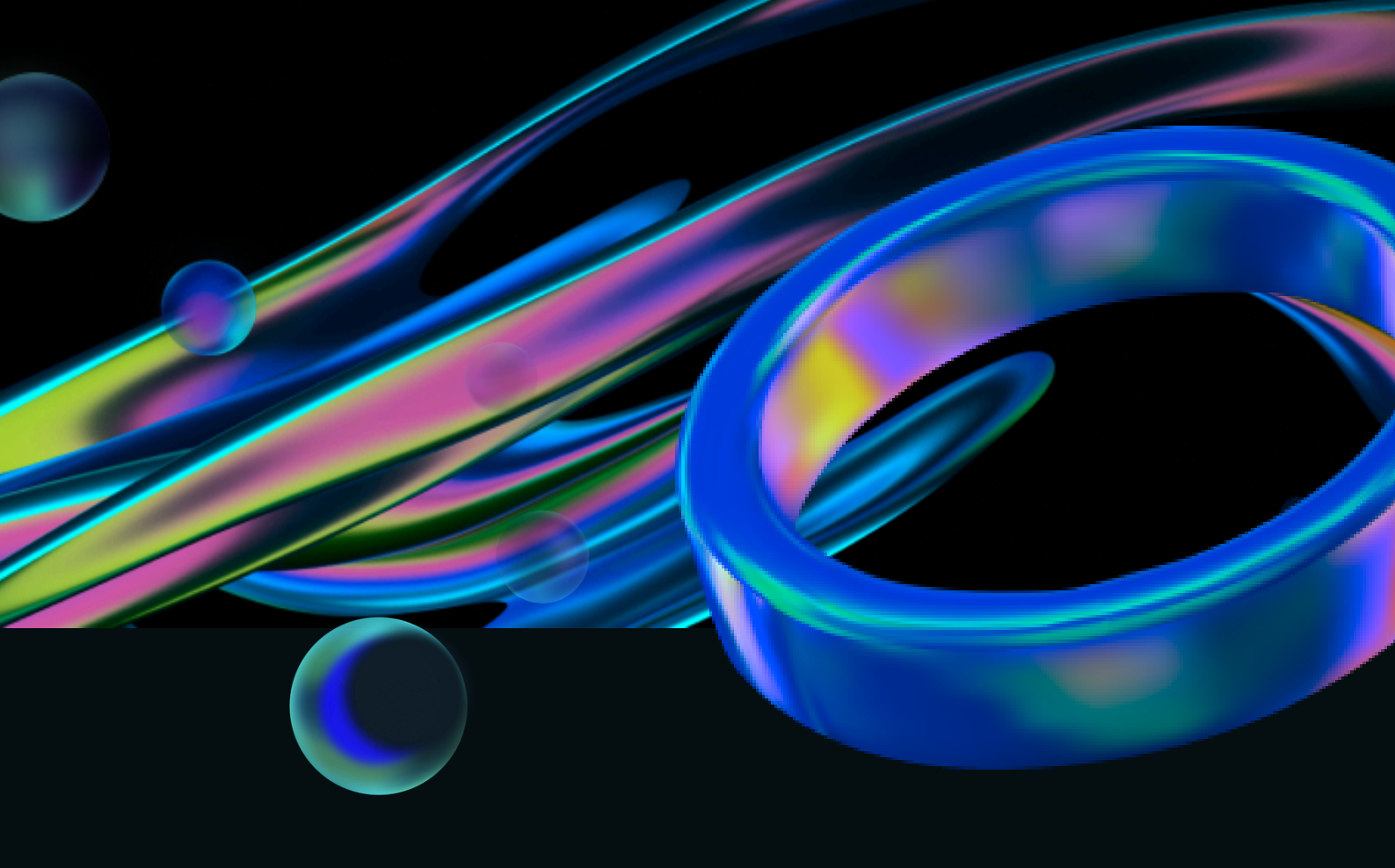
To showcase this, we will use the previous example but add a third week of trading data. Note that technically each trade would affect the VIP-minting rate, but for simplification, these examples will assume 7D volume is batched weekly.

Week 3	Volume	7D Volume	Mint Rate
Alice	\$10,000	\$10,000	1.04
Bob	\$40,000	\$40,000	1.15
Charlie	\$200,000	\$200,000	1.59
David	\$100,000	\$0	1

In this situation, a 4th trader, David has been added. Since David is new to Siren, he does not have a history of trailing trade data to boost his mint rate like Alice, Bob and Charlie. By multiplying the mint-rate to current volume, Charlie receives notably more VIP than previously expected, resulting in him earning more than three times as much SIREN as David, although David did only half as much trading volume.

Week 3	VIP	SIREN
Alice	10,400	4,757
Bob	46,000	21,041
Charlie	318,000	145,460
David	100,000	45,742

VIP can be further customized to enable any number of bonuses. For example, the asset traded could have different multipliers, so that trading ETH is more rewarding than trading BTC. Additionally, a default mint-rate boost of 1x will be applied to accounts with active NFT subscriptions.

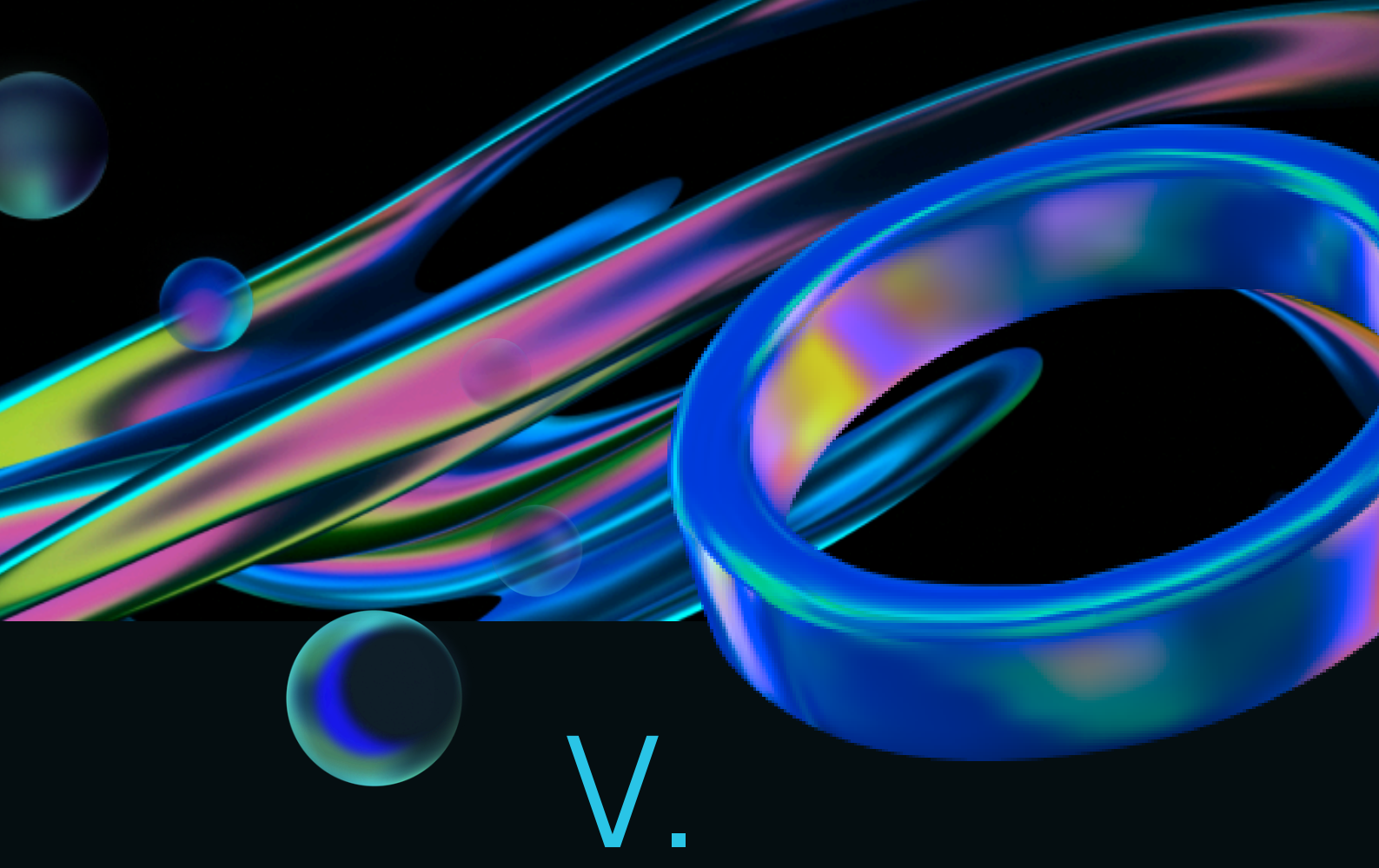


IV. POINTS AND GROWTH CAMPAIGNS

IV.

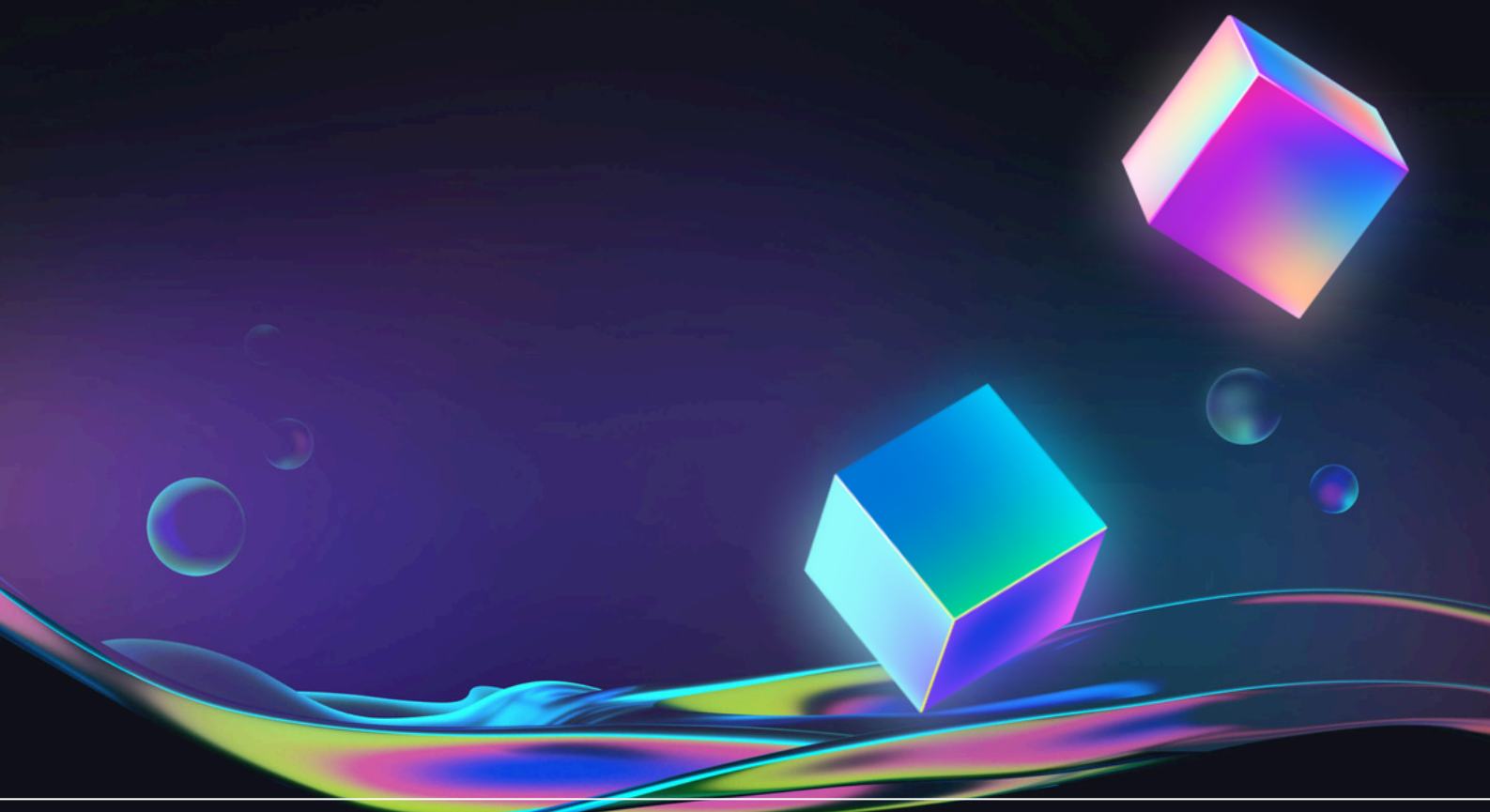
POINTS & GROWTH CAMPAIGNS

Points are a dynamic leveling system where users can earn badges in various categories based on any number of facets of participation. The badges earned from leveling up come with additional boosts and earnings. This system enables referrers to earn more than just trading fees, allows parties helping with marketing to earn for their participation, and can conceivably tap into any measurable goal deemed worthy of rewards by the SIREN DAO. In addition to badge boosts, campaigns may end with airdrops or token spends, distributed according to cumulative points earned. While the VIP initiative perpetually incentivizes trading volume specifically, Points offer more robust earning opportunities and longer term, specialized campaigns. More details of how this will work can be found in **Appendix B.** ¹



V.

REFERRALS





REFERRALS

Revenue for the protocol is derived from fees, which, in turn, come from users. Therefore, user acquisition must be a central component of the growth strategy employed by the Siren DAO.

While user acquisition strategies are not unique to Web3, there are valuable lessons to be drawn from traditional business practices, particularly regarding customer acquisition cost (CAC). Marketing and awareness campaigns play a crucial role, though determining appropriate funding levels can be challenging due to their subjective nature. To achieve scalable growth in a truly decentralized manner, the Siren protocol will introduce user referral codes, enabling anyone to contribute to the expansion of the DAO without requiring permission.

Through our referral portal, any entity can obtain a unique URL to onboard new users. When a new user registers through this link, their account will be linked to the referrer's wallet, facilitating fee-sharing. Participation rewards will vary based on engagement levels, akin to industrial sales departments, with all bonuses and incentives parameterized and governed by the Siren DAO.

The primary referral rewards will be baked into the VIP and Points initiatives. Referrers can earn VIP based upon the volume of their successful referrals.

Example:

Alice refers Bob to trade on Siren, and earns 20% of the VIP Bob earns.

If Bob trades \$10,000 and earns 10,000 VIP, then Alice will also earn 2,000 VIP, and a total of 12,000 VIP will have been minted for the volume.

Secondary referral rewards are earned on a per-referral basis through Points campaigns.

Example:

Alice refers 11 people who trade a qualifying amount on Siren.

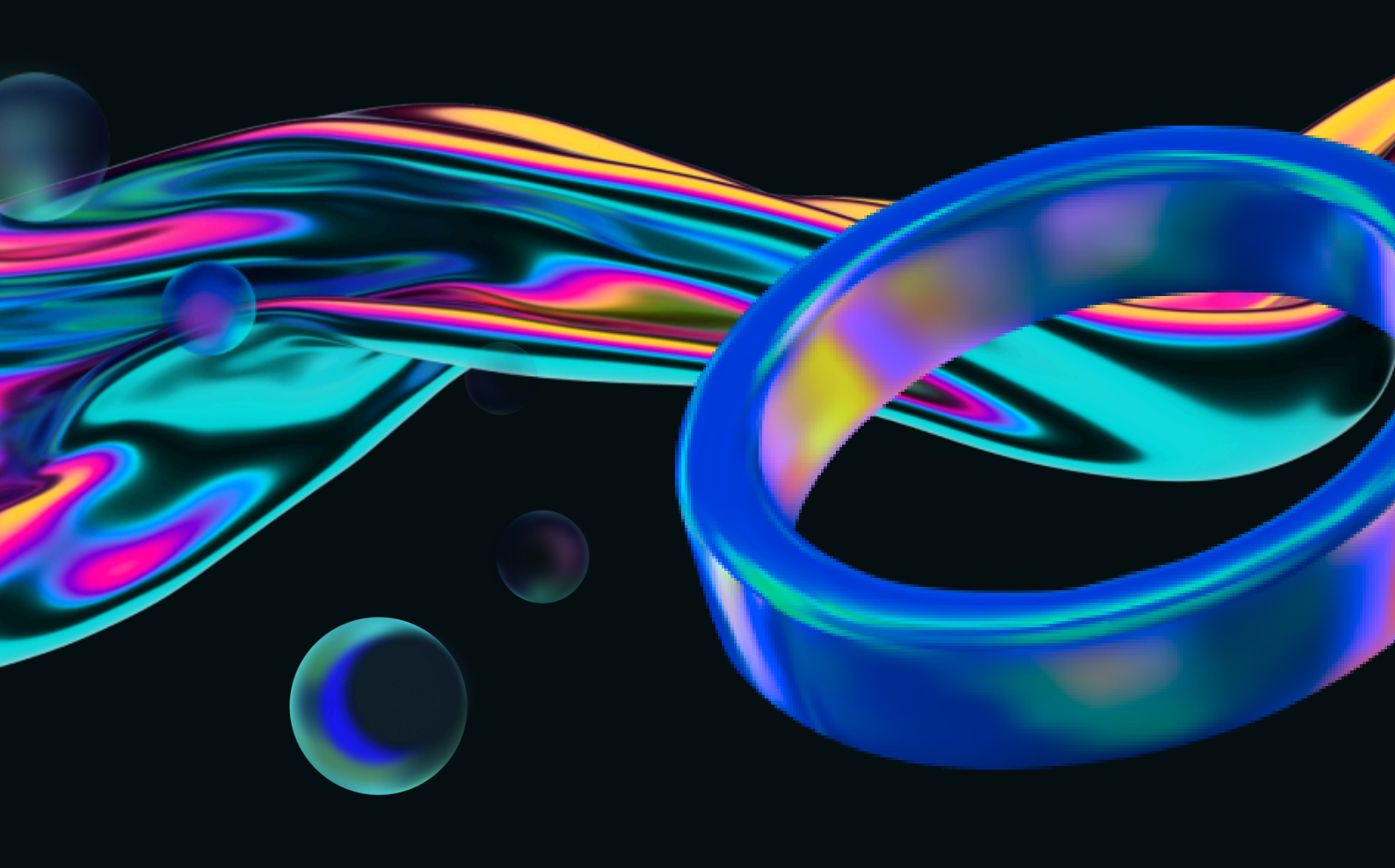
Level	Referrals	Points	Multiplier	Type	Duration
1	1	50	20%	VIP	3 MONTHS
2	3	40	25%	VIP	6 MONTHS
3	10	30	30%	VIP	9 MONTHS
4	25	20	40%	VIP	1 YEAR

The following breakdown shows Alice's Points earned from her referrals, including diminishing returns in points at higher tiers:

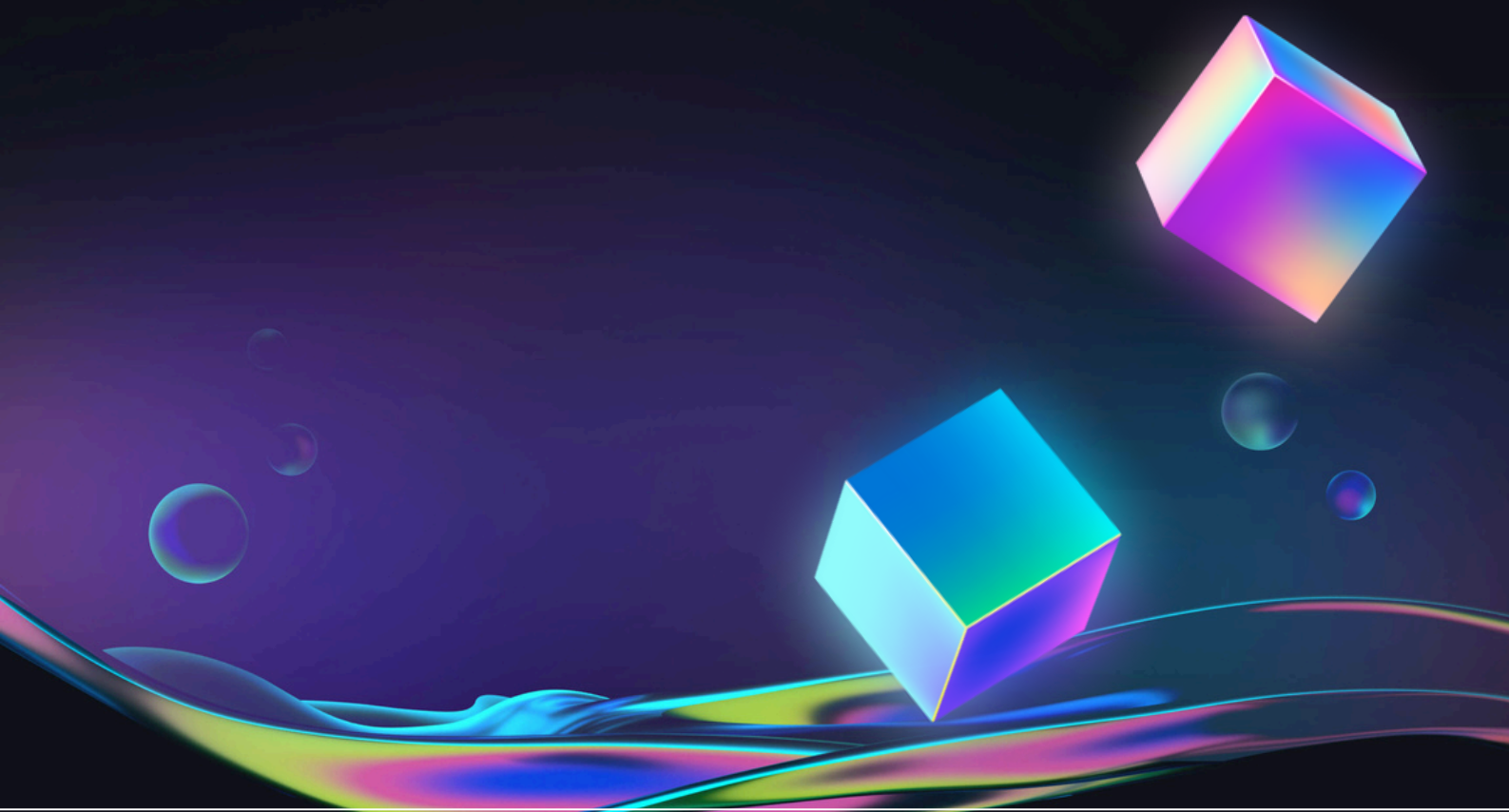
1	50
2	50
3	50
4	40
5	40
6	40
7	40
8	40
9	40
10	40
11	30
Total	460

Alice receives points per referral and unlocks three tier badges along the way. Her tier rewards now include earning 30% of the VIP of all traders she referred for nine months. If an additional token bonus is offered at the culmination of the campaign, then her 460 Points from this section will be added to the Points earned through trading volume, liquidity, and social participation to give her a raw airdrop score.

More about the Points initiatives and levels can be found in **Appendix B.**¹



VI. STAKING





SIREN

VI.

STAKING

SIREN is the governance token for the Siren protocol and related platform services. Staking SIREN tokens enables holders to participate in and influence the growth of the protocol. In turn, stakers will receive a portion of emissions and incentives from protocol revenue. SIREN seeks to reward its active users with beneficial VIP and Points multipliers, while simultaneously encouraging consistent trading activity to gain the best tier for their respective level of involvement.

Staking rewards will be paid out to stakers through a daily allotment from the incentives distributor. An initial allocation of 40,000,000 SIREN (4% of Total Supply) will bootstrap the Incentives distributor, and staking emissions, as well as staking buyback tokens, will be added to this distributor. The incentives distributor will pay out a parameterized 0.2% of its total supply to stakers each day.

The constant emission of 0.2% per day is meant to avoid supply shocks and staking volatility, ensuring that stagnation, or 0% APR, never occurs. This leads to perpetually-decreasing rewards, while never running out. In order to counteract the decrease, part of inflation (shown in the Emissions section) will be regularly added to this allocation, as well as a parameterized 50% of fee revenue.

Example:

Token Emission Schedule:



As use of the Siren protocol increases, more SIREN tokens are bought back and locked in the incentives distributor, which leads to both a decrease in circulating supply and increase in staking rewards. This system balances inflation and deflation of the token supply

Staking rewards will be distributed in accordance with reward weights rather than solely by the amount staked per user. This design means there will be vastly different APRs for stakers based on how much they engage with the platform, creating further incentives for driving volume and other activities that traditionally earn points. Reward weights are another step towards customer-specific pricing. More about staking multipliers can be found in **Appendix C - Example 4.**¹

An added bonus for SIREN stakers extends to the purchase of NFTs for higher-tiered services. This enables high-frequency traders and token stakers to get better services and higher rewards. This also enables direct and consistent sales revenue to fund protocol operations directly.



SIREN



CONCLUSION



CONCLUSION

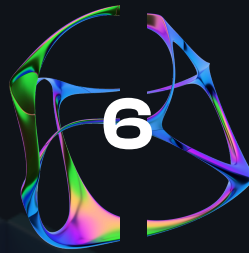
The SIREN token will fuel the decentralized growth of the Siren protocol. By efficiently approaching consumer-specific pricing, the SIREN token can maintain a low net-inflation rate. SIREN provides proper incentives for growth while strategically minimizing risk. The built-in dynamic balancing between beneficial dilution and demand-based scarcity brings stability and sustainability to the protocol. A stable and liquid token for the Siren protocol will enable the platform to grow, empowering the project to fulfill its mission of aiding financial democratization, giving all people permissionless access to derivatives trading.

A well-crafted token economy is crucial to promoting sustainable development and optimizing the decentralized growth of the Siren ecosystem. This paper lays the foundational framework, however, the scalability and evolution of Siren will depend on the ongoing efforts and strategic governance of the Siren DAO. The ability of the protocol to parametrically adapt and the flexibility of SIREN token mechanics will be key to ensuring the token economy evolves in tandem with the protocol's needs.

SIREN

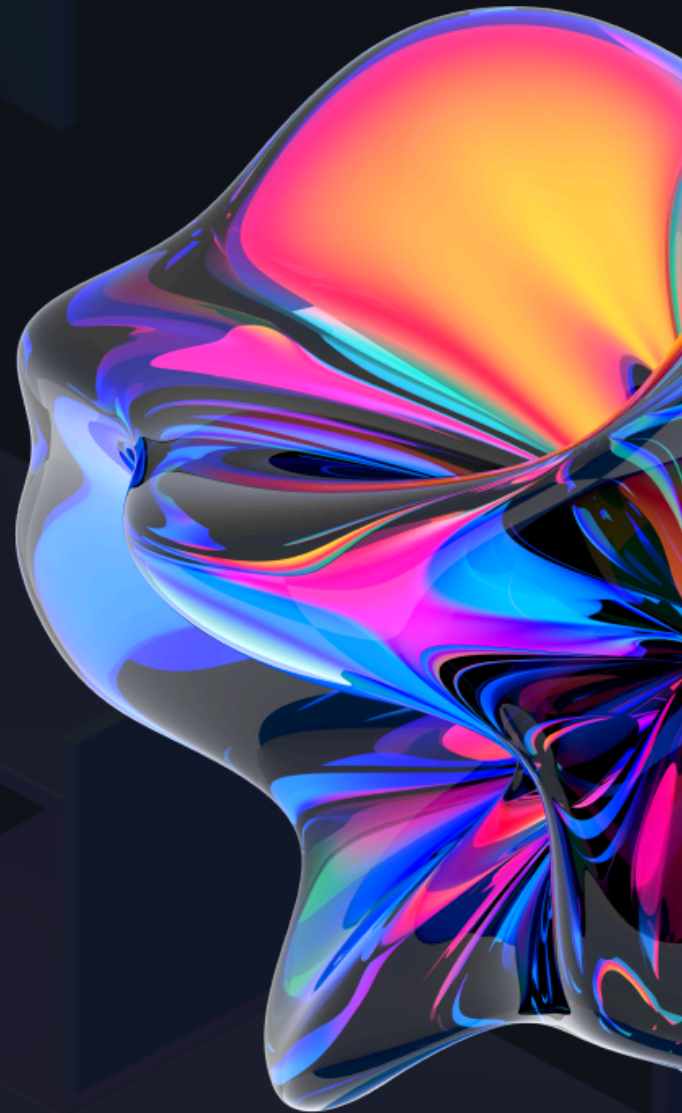


**INITIAL
GOVERNABLE
PARAMETERS**



INITIAL GOVERNABLE PARAMETERS

- Mint Rate | 60,000,000 tokens per year
- Emissions percent by category
 - 27% Ecosystem
 - 21% Community Pool
 - 33% Staking Rewards
 - 19% VIP
- Revenue Delegation
 - Staking Rewards | 50%
 - SIREN Burn | 40%
 - Operations | 10%



SIREN



**APPENDIX
A**

APPENDIX A

NET INFLATION

Inflation occurs with a set mint rate of 60,000,000 SIREN tokens per year. Inflation will be countered by deflation from usage of the protocol, with 40% of fees buying and burning SIREN. The set mint rate means that inflation will decrease as net inflation occurs or when the amount of SIREN burned is less than 60,000,000 SIREN per year.

For the following examples, it will be assumed that SIREN is minted once daily at a rate of 164,384 tokens per day, and a fixed price of \$0.05 per SIREN token will be arbitrarily assumed so that mock revenue numbers can suggest nominal SIREN burning values. Fees will be assumed to be distributed once per day, evenly each day for a calendar year.

The following examples are simplified to show how experienced inflation rates will vary over time. Actual results will vary and values are not precise.

KEY TERMS & VARIABLES

S = Supply of SIREN

P = Price of SIREN (assumed \$0.05 arbitrarily for reference)

AR = Annual Revenue (DAO)

BR = Burn Rate | 40% (percent of revenue contributing to SIREN burns)

$Inflation_x$ = inflation rate on day 'x'

$Deflation_x$ = deflation rate on day 'x'

$$Inflation_x = \left(\frac{S_x}{S_{x-1}} - 1 \right) \times 365$$

$$Deflation_x = \frac{AR \times BR}{P \times S_{x-1}}$$

$Net = Inflation - Deflation$

EXAMPLE 1

MAXIMUM NET INFLATION

$$AR = \$0$$

$$Inflation_1 = \left(\frac{1,000,164,384}{1,000,000,000} - 1 \right) \times 365 = 6\%$$

$$Deflation_1 = \frac{0 \times 0.4}{\$0.05 \times 1,000,000,000} = 0\%$$

$$Net = 6\% - 0\% = 6\%$$

$$Inflation_{366} = \left(\frac{1,060,164,384}{1,060,000,000} - 1 \right) \times 365 = 5.66\%$$

$$Deflation_{366} = \frac{0 \times 0.4}{\$0.05 \times 1,000,000,000} = 0\%$$

$$Net = 5.66\% - 0\% = 5.66\%$$

This example shows that inflation is consistently decreasing as the supply increases, and though the initial inflation rate is 6%, that is not a constant, and decreases to 5.66% after 12 months.

EXAMPLE 2

MODERATE NET INFLATION

$$AR = \$5,000,000$$

$$Inflation_1 = \left(\frac{1,000,164,384}{1,000,000,000} - 1 \right) \times 365 = 6\%$$

$$Deflation_1 = \frac{\$5,000,000 \times 0.4}{\$0.05 \times 1,000,000,000} = 4\%$$

$$Net = 6\% - 4\% = 2\%$$

$$Inflation_{366} = \left(\frac{1,020,164,384}{1,020,000,000} - 1 \right) \times 365 = 5.88\%$$

$$Deflation_{366} = \frac{\$5,000,000 \times 0.4}{\$0.05 \times 1,020,000,000} = 3.92\%$$

$$Net = 5.88\% - 3.92\% = 1.96\%$$

This example shows that at the assumed fixed price, with \$5M in annual revenue, \$2M worth of token burns will combat inflation to the point that despite an initial 6% inflation rate, the total supply only increases by 2% over the year, or the net inflation was only 1.96%.

Note that here $Inflation_{366}$ is 5.88% as opposed to just 5.66% in Example 1. This shows that with a parameterized fixed emissions rate, the more net inflation occurs (supply increases) the lower inflation gets.

EXAMPLE 3

NET INFLATION

$$AR = \$15,000,000$$

$$Inflation_1 = \left(\frac{1,000,164,384}{1,000,000,000} - 1 \right) \times 365 = 6\%$$

$$Deflation_1 = \frac{\$15,000,000 \times 0.4}{\$0.05 \times 1,000,000,000} = 12\%$$

$$Net = 6\% - 12\% = -6\%$$

$$Inflation_{366} = \left(\frac{940,164,384}{940,000,000} - 1 \right) \times 365 = 6.38\%$$

$$Deflation_{366} = \frac{\$15,000,000 \times 0.4}{\$0.05 \times 940,000,000} = 12.77\%$$

$$Net = 6.38\% - 12.77\% = -6.39\%$$

This example shows that at the assumed fixed price, with \$15M in annual revenue, \$6M worth of token burns will combat inflation to the point that despite an initial 6% inflation rate, the total supply actually decreases over the course of the year.

As net deflation occurs, or the total supply decreases over the year, the inflation rate actually increases from 6% to 6.38%, though the number of SIREN tokens minted daily does not change. The more nominal tokens are burned, the lower the total supply will be. The lower the net inflation rate, the higher the inflation rate will be.

The community can vote to adjust parameters such as fee rates, mint rate and burn rate, but factors such as price will always be independent variables, not controlled by the Siren DAO or any participants.

SIREN



**APPENDIX
B**

APPENDIX B

POINTS SIMULATION

Initially, Siren will consider four components towards calculating the points that a user may earn: Volume Traded, Liquidity Provided, Referrals, and Social Activity. Each section will have its own unique badges to be earned at different levels, and each badge will come with greater boosts for earnings through the VIP protocol. The campaign will culminate with an airdrop in which weights are factored by one's cumulative Points score.

Similar to the Referrals, Points can be factored both cumulatively and in sprints, meaning additional temporary badges can be rolled out promotionally for specific campaigns without worrying about exclusivity or conflicts between promotions.

In the following example charts, different thresholds for levels are shown by category for an initial go-to-market campaign. Accompanying boosts for badges only apply after a badge is earned. All numbers and simulations are theoretical examples only and are not meant to be taken as exact plans.

POINTS SIMULATION

Level	Volume	Points	Multiplier	Type	Duration
1	\$1,000	1	1.1	VIP	3 MONTHS
2	\$5,000	0.75	1.25	VIP	6 MONTHS
3	\$20,000	0.5	1.4	VIP	9 MONTHS
4	\$100,000	0.5	1.6	VIP	1 YEAR
5	\$500,000	0.2	2	VIP	1 YEAR

Level	Liquidity	Points	Multiplier	Type	Duration
1	\$1,000	2	1.1	STAKING	3 MONTHS
2	\$5,000	1.5	1.2	STAKING	6 MONTHS
3	\$20,000	1	1.3	STAKING	9 MONTHS
4	\$100,000	0.5	1.4	STAKING	1 YEAR
5	\$500,000	0.3	1.5	STAKING	1 YEAR

Level	Referrals	Points	Multiplier	Type	Duration
1	1	50	20%	VIP	3 MONTHS
2	3	40	25%	VIP	6 MONTHS
3	10	30	30%	VIP	9 MONTHS
4	25	20	40%	VIP	1 YEAR

Level	Socials	Points	Multiplier	Type	Duration
1	1	20	1.1	STAKING	3 MONTHS
2	5	10	1.2	STAKING	6 MONTHS
3	20	5	1.3	STAKING	9 MONTHS

For example: if Zoe trades \$1,200 worth of volume, then the first \$1,000 would earn Points at a normal rate, while the next \$200 would be after earning the Volume Level 1 badge, and would earn points at a 1.1X rate.

Following are two users with differing levels activity and boosts:

EXAMPLE 1

LEVEL BOOSTS

Alice trades \$3,000 in Volume, provides \$2,000 in Liquidity, makes 4 Referrals and has 4 eligible Social Activities.



Looking at volume specifically, Alice would initially be earning her normal VIP rate, but once she passes the \$1,000 volume threshold and mints the Level 1 Volume badge, her VIP earnings will be multiplied by 1.1X until 3 months from the beginning of the campaign. Should Alice take 2 months to mint the badge, the boost will only last for a remaining 1 month, but reaching the next level would extend the rewards.

In the same manner that Volume already has a built-in reward program in VIP, Liquidity, Marketing, and Social engagements can be profitable independently, as well. For example, when liquidity providers are already participating for the profitability of earning as a market maker, the boost to staking rewards once Level 1 is reached is not just a token of appreciation but can further help to encourage both existing holders to LP and existing LPs to begin holding and staking.

Alice's total Level for the campaign would be depicted as "5" (sum of all category badges), but her rewards would still be her unique mix of the different sections. The chart below compares Alice's rewards with Joe, another Level 5 who achieved this with only trading volume and liquidity.



ALICE

Category	Level	Multiplier	Type
Volume	1	1.1	VIP
Liquidity	1	1.1	STAKING
Referrals	2	1.4	VIP
Socials	1	1.1	STAKING

JOE

Category	Level	Multiplier	Type
Volume	3	1.4	VIP
Liquidity	2	1.2	STAKING
Referrals	0	1	VIP
Socials	0	1	STAKING

Note that multipliers are factored independently, so with Alice qualifying for 2 different staking reward multipliers, her reward weight (RW) will be factored:

$$RW_{total} = RW_{initial} \times 1.1 \times 1.1 = 1.21RW_{initial}$$

This means that Alice's 2 multipliers of 1.1 combined are worth more than Joe's single multiplier of 1.2.

This means that Alice's 2 multipliers of 1.1 combined are worth more than Joe's single multiplier of 1.2.

Analysis of Reward Structures for Alice and Joe:

- **Staking Rewards:** Alice receives a marginally higher boost in her staking rewards compared to Joe.
- **VIP Benefits:** Alice also earns VIP at a higher rate than Joe due to her referral bonuses triggering. Joe most likely earns more nominal VIP due to higher volume, however, if Alice referred high volume traders, she could earn more VIP without trading at all.

This comparison highlights the differential impact of various reward mechanisms on participants with different levels of activity and engagement.

SIREN



**APPENDIX
C**

APPENDIX C

STAKING

Staking is meant for aligned participants to direct the growth of the Siren platform through DAO governance. For the following examples, it will be assumed that 35,000 SIREN are added to the staking contract once per day, and a fixed price of \$0.05 per SIREN token will be arbitrarily assumed so that mock USD-denominated DAO revenue can translate to nominal token amounts. The variable BO for Bonded Rate will be assumed to be a fixed 25%. Annual Revenue will be assumed to be earned evenly per day.

The following examples are simplified to show how experienced inflation rates will vary over time. Actual results will vary and values are not precise.

KEY TERMS & VARIABLES

APR = Annual Percentage Rate

P = Price of SIREN (assumed \$0.05 arbitrarily for reference)

AR = Annual Revenue

SR = Stake Rate | 50% (percent of revenue contributing to SIREN staking rewards)

BO = Bonded Rate | Percentage of the total supply that is staked (assumed 25% for reference)

RW = Reward Weight | derived number post-multipliers that is used to determine nominal staking rewards

E = Emissions

E_x = Emissions for day 'x'

E_{sum} = Cumulative Emissions

I = Incentives | Tokens locked in the incentives contract

I_0 = 40,000,000 | Initial incentives tranche allocation

IR = Variable Incentives allocation coming from DAO revenue share

II = 35,000 SIREN per day | Incentives allocation coming from inflation

FORMULAS

$$I = I_0 + IR + II - E$$

$$IR = \frac{AR \times SR}{P}$$

$$II = 35,000 \text{ SIREN per day}$$

$$\Delta I = I_x - I_{x-1}$$

$$E_x = 0.002 \times I_{x-1}$$

EXAMPLE 1**MINIMUM STAKING REWARDS**

Assume:

- $AR = \$0$

So:

- $IR = \frac{\$0 \times 0.5}{\$0.05} = 0 \text{ SIREN}$

1. Day 1 Staking Results

$$E_1 = 0.002 \times 40,000,000 = 80,000$$

$$I_1 = 40,000,000 + 0 + 35,000 - 80,000 = 39,955,000$$

$$\Delta I_1 = 39,955,000 - 40,000,000 = -45,000$$

2. Day 2 Staking Results

$$E_2 = 0.002 \times 39,955,000 = 79,910$$

$$I_2 = 39,955,000 + 0 + 35,000 - 79,910 = 39,910,090$$

$$\Delta I_2 = 39,910,090 - 39,955,000 = -44,910$$

As emissions are a set rate of the incentives contract, the lowest possible staking rewards stem from the lowest possible supply locked in the incentives contract. The inflation allocation is a preset parameter. The only variable allocation is from revenue. Setting the revenue to \$0 allows us to show the lowest possible amount of emissions, so far shown at a daily rate.

At current parameters, ΔI will logarithmically trend closer to 0 as $I \rightarrow 17,500,000$, which is $500 \times II$.

Let's speed up the process and show this extrapolated over 30 months. (APR assumes $BO = 25\%$)

STAKING REWARDS (IN SIREN)

Month	Incentives Account Balance	Emissions Tokens	IR	Staking Rewards	AVG APR
1	40,000,000	1,050,000	0	2,463,000	11.82%
2	38,587,000	1,050,000	0	2,378,220	11.42%
3	37,258,780	1,050,000	0	2,298,527	11.03%
4	36,010,253	1,050,000	0	2,223,615	10.67%
5	34,836,638	1,050,000	0	2,153,198	10.34%
6	33,733,440	1,050,000	0	2,087,006	10.02%
7	32,696,433	1,050,000	0	2,024,786	9.72%
8	31,721,647	1,050,000	0	1,966,299	9.44%
9	30,805,349	1,050,000	0	1,911,321	9.17%
10	29,944,028	1,050,000	0	1,859,642	8.93%
11	29,134,386	1,050,000	0	1,811,063	8.69%
12	28,373,323	1,050,000	0	1,765,399	8.47%
13	27,657,923	1,050,000	0	1,722,475	8.27%
14	26,985,448	1,050,000	0	1,682,127	8.07%
15	26,353,321	1,050,000	0	1,644,199	7.89%
16	25,759,122	1,050,000	0	1,608,547	7.72%
17	25,200,575	1,050,000	0	1,575,034	7.56%
18	24,675,540	1,050,000	0	1,543,532	7.41%
19	24,182,008	1,050,000	0	1,513,920	7.27%
20	23,718,087	1,050,000	0	1,486,085	7.13%
21	23,282,002	1,050,000	0	1,459,920	7.01%
22	22,872,082	1,050,000	0	1,435,325	6.89%
23	22,486,757	1,050,000	0	1,412,205	6.78%
24	22,124,552	1,050,000	0	1,390,473	6.67%
25	21,784,078	1,050,000	0	1,370,045	6.58%
26	21,464,034	1,050,000	0	1,350,842	6.48%
27	21,163,192	1,050,000	0	1,332,792	6.40%
28	20,880,400	1,050,000	0	1,315,824	6.32%
29	20,614,576	1,050,000	0	1,299,875	6.24%
30	20,364,702	1,050,000	0	1,284,882	6.17%

STAKING REWARDS



EXAMPLE 2

DECREASING STAKING REWARDS

Assume:

- $AR = \$3,000,000$

So:

- $IR = \frac{\$3,000,000 \times 0.5}{\$0.05} = 30,000,000$ SIREN
- $IR_x = \frac{30,000,000}{365} = 82,192$ SIREN per day

1. Day 1 Staking Results

$$E_1 = 0.002 \times 40,000,000 = 80,000$$

$$I_1 = 40,000,000 + 82,192 + 35,000 - 80,000 = 40,037,192$$

$$\Delta I_1 = 40,037,192 - 40,000,000 = 37,192$$

2. Day 2 Staking Results

$$E_2 = 0.002 \times 40,037,192 = 80,074$$

$$I_2 = 40,037,192 + 82,192 + 35,000 - 80,074 = 40,074,310$$

$$\Delta I_2 = 40,074,310 - 40,037,192 = 37,118$$

With significant revenue factored in, assuming stagnation of the independent variable of Price, here the amount of tokens time-locked in the incentives allocation is growing. At this rate the net inflation is down to 3.60% while stakers are experiencing an average APR of around 12.4% and increasing. This keeps significantly more of the total supply perpetually locked in the incentives contract. Extrapolated over 30 months:

STAKING REWARDS (IN SIREN)

Month	Incentives Account Balance	Emissions Tokens	IR	Staking Rewards	AVG APR
1	40,000,000	1,050,000	2,000,000	2,583,000	12.40%
2	40,467,000	1,050,000	2,000,000	2,611,020	12.53%
3	40,905,980	1,050,000	2,000,000	2,637,359	12.66%
4	41,318,621	1,050,000	2,000,000	2,662,117	12.78%
5	41,706,504	1,050,000	2,000,000	2,685,390	12.89%
6	42,071,114	1,050,000	2,000,000	2,707,267	12.99%
7	42,413,847	1,050,000	2,000,000	2,727,831	13.09%
8	42,736,016	1,050,000	2,000,000	2,747,161	13.19%
9	43,038,855	1,050,000	2,000,000	2,765,331	13.27%
10	43,323,524	1,050,000	2,000,000	2,782,411	13.36%
11	43,591,112	1,050,000	2,000,000	2,798,467	13.43%
12	43,842,646	1,050,000	2,000,000	2,813,559	13.51%
13	44,079,087	1,050,000	2,000,000	2,827,745	13.57%
14	44,301,342	1,050,000	2,000,000	2,841,081	13.64%
15	44,510,261	1,050,000	2,000,000	2,853,616	13.70%
16	44,706,645	1,050,000	2,000,000	2,865,399	13.75%
17	44,891,247	1,050,000	2,000,000	2,876,475	13.81%
18	45,064,772	1,050,000	2,000,000	2,886,886	13.86%
19	45,227,886	1,050,000	2,000,000	2,896,673	13.90%
20	45,381,213	1,050,000	2,000,000	2,905,873	13.95%
21	45,525,340	1,050,000	2,000,000	2,914,520	13.99%
22	45,660,819	1,050,000	2,000,000	2,922,649	14.03%
23	45,788,170	1,050,000	2,000,000	2,930,290	14.07%
24	45,907,880	1,050,000	2,000,000	2,937,473	14.10%
25	46,020,407	1,050,000	2,000,000	2,944,224	14.13%
26	46,126,183	1,050,000	2,000,000	2,950,571	14.16%
27	46,225,612	1,050,000	2,000,000	2,956,537	14.19%
28	46,319,075	1,050,000	2,000,000	2,962,145	14.22%
29	46,406,931	1,050,000	2,000,000	2,967,416	14.24%
30	46,489,515	1,050,000	2,000,000	2,972,371	14.27%

STAKING REWARDS



EXAMPLE 3

INCREASING STAKING REWARDS

Assume:

- $AR = \$20,000,000$

So:

- $IR = \frac{\$20,000,000 \times 0.5}{\$0.05} = 200,000,000$ SIREN
- $IR_x = \frac{200,000,000}{365} = 547,945$ SIREN per day

1. Day 1 Staking Results

$$E_1 = 0.002 \times 40,000,000 = 80,000$$

$$I_1 = 40,000,000 + 547,945 + 35,000 - 80,000 = 40,502,945$$

$$\Delta I_1 = 40,502,945 - 40,000,000 = 502,945$$

2. Day 2 Staking Results

$$E_2 = 0.002 \times 40,502,945 = 81,006$$

$$I_2 = 40,502,945 + 547,945 + 35,000 - 81,006 = 41,004,884$$

$$\Delta I_2 = 41,004,884 - 40,502,945 = 501,939$$

With demonstrative revenue factored in, assuming stagnation of the independent variable of price, the incentives contract is now hoarding more float tokens, and the circulating supply is actively decreasing despite staking APRs increasing. At this rate the net inflation is at an unsustainable -10% and dropping. $\Delta I > 0$ would mean significant reductive pressures on circulating supply, but deflation this substantial suggests purchasing almost 30% of the initial total supply, reducing the float to negative numbers.

It would not be possible for independent variables such as Price, that were assumed stagnant for simplicity's sake, to maintain their arbitrarily fixed position.

Extrapolated over 30 months:

STAKING REWARDS (IN SIREN)

Month	Incentives Account Balance	Emissions Tokens	IR	Staking Rewards	AVG APR
1	40,000,000	1,050,000	13,333,333	3,263,000	15.66%
2	51,120,333	1,050,000	13,333,333	3,930,220	18.87%
3	61,573,447	1,050,000	13,333,333	4,557,407	21.88%
4	71,399,373	1,050,000	13,333,333	5,146,962	24.71%
5	80,635,744	1,050,000	13,333,333	5,701,145	27.37%
6	89,317,933	1,050,000	13,333,333	6,222,076	29.87%
7	97,479,190	1,050,000	13,333,333	6,711,751	32.22%
8	105,150,772	1,050,000	13,333,333	7,172,046	34.43%
9	112,362,059	1,050,000	13,333,333	7,604,724	36.50%
10	119,140,669	1,050,000	13,333,333	8,011,440	38.45%
11	125,512,562	1,050,000	13,333,333	8,393,754	40.29%
12	131,502,142	1,050,000	13,333,333	8,753,129	42.02%
13	137,132,347	1,050,000	13,333,333	9,090,941	43.64%
14	142,424,739	1,050,000	13,333,333	9,408,484	45.16%
15	147,399,588	1,050,000	13,333,333	9,706,975	46.59%
16	152,075,946	1,050,000	13,333,333	9,987,557	47.94%
17	156,471,723	1,050,000	13,333,333	10,251,303	49.21%
18	160,603,753	1,050,000	13,333,333	10,499,225	50.40%
19	164,487,861	1,050,000	13,333,333	10,732,272	51.51%
20	168,138,923	1,050,000	13,333,333	10,951,335	52.57%
21	171,570,920	1,050,000	13,333,333	11,157,255	53.55%
22	174,796,999	1,050,000	13,333,333	11,350,820	54.48%
23	177,829,512	1,050,000	13,333,333	11,532,771	55.36%
24	180,680,075	1,050,000	13,333,333	11,703,804	56.18%
25	183,359,603	1,050,000	13,333,333	11,864,576	56.95%
26	185,878,361	1,050,000	13,333,333	12,015,70	57.68%
27	188,245,992	1,050,000	13,333,333	12,157,760	58.36%
28	190,471,566	1,050,000	13,333,333	12,291,294	59.00%
29	192,563,605	1,050,000	13,333,333	12,416,816	59.60%
30	194,530,122	1,050,000	13,333,333	12,534,807	60.17%

STAKING REWARDS



EXAMPLE 4

MULTIPLIERS

Staking rewards will be distributed based on reward weight (“RW”) rather than raw staked tokens, so that active and long-term aligned users have a greater say in governance, and a greater share of protocol incentives.

In this example 10 users will all be staking different amounts, with different lockup durations, and multiplier qualifications. They will in turn experience dramatically different returns.

Default APR	Staked Tokens	Lock (Months)	Multi plier	Daily Trade	Multi plier	Trident	Multi plier	Capped Out	Multi plier	Lockup Read	Monthly Rewards	APR	APY
15.66 %	20,000,000	48	5.00	Y	2.00	Y	2	Y	2	800,000,000	820,131	49%	64%
	4,000,000	1	1.08	N	1.00	Y	2	Y	2	17,333,333	17,769	5%	5%
	200,000	2	1.17	Y	2.00	Y	2	Y	2	1,866,667	1,914	22%	12%
	550,070	14	2.17	N	1.00	N	1	N	1	1,191,818	1,222	3%	3%
	14,658,350	12	2.00	Y	2.00	N	1	N	1	58,633,400	60,109	5%	5%
	60,000,000	5	1.42	N	1.00	N	1	N	1	85,000,000	87,139	2%	2%
	5,543,540	23	2.92	Y	2.00	N	1	N	1	32,337,317	33,151	7%	7%
	11,235,410				1.00	N	1	N	1	14,044,263	14,398	2%	2%
	2,500				2.00	N	1	N	1	10,000	10	5%	5%
	13,810,130				1.00	N	1	N	1	13,810,130	14,158	1%	1%
TOTAL	130,000,000									1,024,226,928	1,050,000		

The incentive structure, which prioritizes daily active users ("DAU"), protocol partners, investors in SIREN Subscription NFTs, and those who commit to long-term token lock-ups, is designed to offer immediate benefits for active community members while also providing significant incentives to engage participants who typically remain passive. This system allows for the addition of further reward multipliers and the continual adjustment of boost weights, ensuring flexibility and alignment with the strategic objectives of Siren's growth.

SIREN

Discord

<https://discord.gg/wkSNxE4R>

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<https://twitter.com/sirenprotocol>

Docs

<docs.siren.xyz>

Website

<siren.xyz>

dApp

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