VolCoin White Paper
A coin to allow protection against the Volatility of Bitcoin

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Abstract

This document and the associated technologies are under development and subject to change.

VolCoin is a decentralised algorithmic crypto currency whose price is determined according to the price volatility of Bitcoin. The protocol is built on Ethereum and Optimistic Ethereum (a layer two scaling solution built on Ethereum). VolCoin will be collateralized by USDC and GVolCoin, a governance coin for the protocol (described in more detail below). VolCoin and GVolCoin holders are incentivised to hold and stake their coins as they are paid fees from transactions on the protocol.

Motivation

Blockchain technologies are ushering in a revolutionary change to traditional internet computing paradigms. While the internet allows for the nearly-free and nearly-instant transfer of information, blockchains will allow for the nearly-free and nearly-instant transfer of value, paving the way for native currencies on the world wide web. Similar to how the internet disrupted traditional media companies (television networks, newspapers, and radio), blockchain technology will disrupt traditional financial institutions such as banks, loan providers, accounting firms, and so forth.

We have already seen the seeds of this disruption take root in decentralized finance (DeFi) projects. At the time of this writing, there is more than $50 billion locked in various DeFi protocols. The rapid adoption of these nascent projects is a testament to how powerful the technology is, and still only a glimpse of what is to come, decentralized financial applications are just the beginning. Smart contracts enable a shift in programming paradigms, allowing the automation of almost everything from legal contracts, to the promise of decentralized autonomous organizations (DAOs), to the proliferation of non-fungible tokens (NFTs), and so much more.

However in order for this internet money to become mainstream and usher in the revolution, the price volatility of the whole industry needs to managed better, or at least sophisticated traders and institutions need to be guarded from the vicious price swings. Volatility, or how fast prices change, is often seen as a way to gauge market sentiment, and in particular the degree of fear among market participants.

At the time of writing Bitcoin is down over 50% from all-time highs which in turn has affected the whole crypto market. The only way traders have been able to navigate this is by selling their coins or buying put options and crypto traders have emotional attachment to their coins and don’t like selling. The ones that sold their coins have had to forgo any yield their coins may have produced and the ones buying options have had to continuously roll their contracts to stay hedged, meaning more costs.

Problem

The extremely high volatility means Cryptocurrencies are thought of as dangerous by regulators and the general public and lead to wider implications for their general use. Traders need a way to protect their portfolios against downward moves in the market.

Using Cryptocurrencies for exchange of Goods and Services

Cryptocurrencies are notoriously volatile, Bitcoin has an average 800% move year on year since 2011 and the smaller alt coins are even more volatile. This makes it very difficult to use as a currency for goods and services as the value of Bitcoin today versus fiat currency can change dramatically on a day to day basis. Since most other crypto currencies follow Bitcoin as a general market indicator it means none of the thousands of other coins can be used a currency for exchange of goods and services either.

New Money coming into the Crypto Market

At the time of writing the Crypto market is worth $2 trillion. The biggest money managers in the world are pension funds and control over $56 trillion of assets worldwide. Institutional money has started to dip their toes in Crypto investing but the amounts are tiny in the grand scheme of things and in order to get more of this money into the market it needs to mature. Meaning more sophisticated products to allow portfolios to hedge against the many downswings in the market.

Current ways to Manage Bear Markets

Currently the only ways to manage a Crypto bear market are to either sell your coins or spend money on option contracts. If a trader was to do the first option it would mean they would lose out on any yield generated by their coins and more importantly a contraction in the overall market as everyone looks to fiat currencies for a safe haven. More importantly we understand the psychology of our target market and no crypto traders ever want to sell their coins unless they are using it to fund other coins.

The second method involves a deep understanding of options, premium to paid upfront and a limited time span of protection for their portfolio.

Current Volatility Indices

Currently volatility indices exist for Bitcoin but there is no way to trade them outright and there are no tokenized versions of these indices. A trader would have to create a synthetic version by buying options and hedging out the delta and theta via a calendar spread which is expensive.

If we look at the more established Equities market the CBOE Volatility Index (VIX) is a real-time index that represents the market's expectations for the relative strength of near-term price changes of the S&P 500 Index (SPX). It is derived from the prices of SPX index options with near-term expiration dates, it generates a 30-day forward projection of volatility. You can currently trade it as a futures contract but this comes with the cost of having to roll it every month which is expensive. Synthetic cash contracts built from two futures contracts also exist but the overnight funding costs are expensive and come with an exchange fee on top which means you are always debited a higher amount than you are credited.

The formula for overnight funding from IG Index is;

Formula for overnight funding adjustment = nights held x (trade size x (basis* +/- IG charge**)).
*Formula for the basis = (P3 – P2) / (T2 – T1), where:
P2 = price of front future
P3 = price of next future
T1 = expiry date of the previous front future
T2 = expiry date of the front future

**Formula for the IG charge = undated mid-price x 2.5% / 365. The undated mid-price is a snapshot of the mid-price of the cash CFD or DFB on the relevant date. If you pay the basis on your trade, the IG charge figure is added; if you receive the basis, it's subtracted.

The funding costs alone are likely to take any profits made by the price swings in the underlying index.

Methodology for Calculating Bitcoin Volatility Index

Below is how Deribit calculates their volatility index Deribit is the largest option trading exchange by volume.

1. Select the 2 expiries, closest to 30 days out, on either side of the 30 days.
2. Calculate the option price using the market depth of bids and asks. If the bid/ask spread is too wide then fallback to using trade prices during the last minute and if that is not available then use the mark price from 1 min ago.
3. Calculate the option implied synthetic. If not enough info/options not tight enough to calculate this, then use the mark price of the synthetic from 1 min ago.
4. Discard the ITM calls and puts. Discard options with very low premiums.
5. Use the variance swap methodology to calculate the variance for the near term and longer-term expiries. Interpolate between the 2 expiries and take the square root.
6. Filter noise and smooth out value calculated, resulting in the index calculation.

Currently Volatility is calculated by looking 30 days into the future (forward-looking) annualised expectation of volatility. To get a rough idea of the expected daily move in Bitcoin, just divide this value by 20. For example, if the Volatility index value = 90 gives an expected daily move of 4.5% (More precisely, you should divide DVOL by the square root of 365 to get an estimate of the expected daily move.)

Solution – VolCoin

The implied volatility of Bitcoin options gives an indication of the expected movement of Bitcoin. Options are a necessary piece of information to calculate a volatility index. Trading options to trade volatility (by trading Vega) comes entangled with other components such as Delta (exposure to movement in the underlying) and Theta (exposure to time decay) amongst others. Volatility Index Futures are not only a very effective and simple method to trade volatility but also much cheaper.

The VolCoin Index

The solution is to tokenize a synthetic index which moves according to the implied volatility of Bitcoin, VolCoin. This will mean in times of greatest fear and decline in the price of Bitcoin the price of VolCoin will rise so giving the holders a hedge in their portfolio against massive moves in the market.

There will be a Bitcoin Volatility Index (BVI) which will be mathematically calculated by;

1. Examine the 5 largest exchanges for their Bitcoin option contracts and collate our data from here.
   - This will be done monthly to ensure we are capturing data from the most relevant places.
2. Calculate the relevant option prices on each exchange.
   - From each exchange we will select Expiry 1, which is the furthest expiry that has less than or equal to 30 days to expire. Expiry 2, which is the closest expiry to have less than or equal to 30 days to expire.
   - We will ignore contracts which are less than 1hr 30 minutes to allow sufficient market participation and ensure there is enough market depth and volume of traded data.
   - If the spread price tight and there is sufficient depth on the bid and ask, the instrument price is the mid depth price;

     mid depth price = (Depth Ask – Depth Bid)/2

   - sufficient tightness of the spread is calculated using the following method

     when DepthAsk – DepthBid ≥ max(min(13% * DepthBid, 0.0031BTC), 0.00251BTC)

   - if the spread is not tight enough then we will use a fallback price

$$\text{Instrument price} = \begin{cases} \text{Mid Depth Price}, & \text{if spread not wide and sufficient bid and ask} \\ \text{VWAP Trade Price}, & \text{if trade exist in last minute} \\ \text{Past Mark Price}, & \text{if mark price exists 120s, 180s ago} \\ \text{Current Mark Price}, & \text{Otherwise} \end{cases}$$

   - The VWAP is the volume-weighted average price on all trades that happened on that instrument in the last 2 minutes.
   - If there were no trades in the last 2 minutes then we use the past mark price in the last 120s, 180s ago.
3. Forward price (synthetic price) calculation for each expiry. Using the option implied synthetic where there are at least 2 full strikes that have both the call and the put

using the Mid Depth price. We calculate abs(Call Mid Depth Price – Put Mid Depth Price) and select the StrikeMin = the strike with the lowest value.

$$\text{Forward} = \frac{\text{StrikeMin}}{1 - \text{Call Mid Depth Price} + \text{Put Mud Depth Price}}$$

- If multiple strikes share the lowest value then we calculate the implied forward by taking an average of all of them.
- If there is not at least 2 strikes where both the call and the put are using the Mid Depth Price, then the forward is the most recent synthetic/ future mark price in the interval (120s, 180s ago) for that expiry.
- If there is no past synthetic price in that interval then we use the current synthetic/ future price for that expiry.
- For each expiry we take the strike cut off to be the strike equal to, or closet strike below the Forward for that expiry
- We discard all instruments where the strikes for calls are less than Expiry strikes cut off and puts are greater than strikes cut off.
- So there will be 2 instruments at the strike cut off and a max of one instrument on the other strikes

4. We dis-guard any instruments which are less than 0.0021 BTC as they can provide a distorted picture of volatility.
5. Use the variance swap methodology to calculate the variance for the near term and longer term expires. Interpolate between the 2 expires and take the square root.
   - Looking at the filtered list of strikes which contain at least 1 non-discarded instrument, for each strike, calculate the StrikeWidth

$$\text{StrikeWidth}_i = \begin{cases} \text{Strike}_i - \text{Strike}_{i-1}, & \text{if Strike}_i \text{ is the highest strike} \\ \text{Stike}_{i+1} - \text{Strike}_i, & \text{if Strike}_i \text{ is the lowest strike} \\ 1/2\,(\text{Strike}_{1+1} - \text{Strike}_{i-1}), & \text{Otherwise} \end{cases}$$

   - At the strike cut off the strike price is the average of the instrument price of the call and the put. Everywhere else, the strike price is the instrument price of the non-discarded instrument at that strike

$$\text{StrikeContribution}_i = \text{Strike Price}_i \times \frac{\text{StrikeWidth}_i \times \text{Forward}}{\text{Strike}_i^2}$$

   - Using the strike contributions we can then calculate the variance of the expiry. T represents the time in years to maturity of that expiry.

$$Variance = \frac{2\sum StrikeContribution_i - \left(\frac{Forward}{StrikeCutoff} - 1\right)^2}{t}$$

   - Now we can get the volatility index of any expiry with

$$\text{VolExp} = (\text{Vol31Mar22}) = 100 \times \sqrt{Variance}$$

   - Now we do a time-weighted interpolation between the 2 selected expiries to calculate a raw value.

BVIRaw = 100

$$\text{BVIRaw} = 100\left[\text{X}\left[\text{t}_1 \text{ X Variance}_1 \text{ X } \frac{\text{t2} - \frac{30}{365}}{t2-t1} + \text{t}_{2\text{ x}} \text{ Variance}_2 \text{ X}\left[\frac{\frac{30}{365}-t1}{t2-t1}\right]^{0.5} \text{X } \frac{365}{30}\right.\right.$$

- The raw BVI value is calculated every second and then filtered for noise and smoothed to give the final price for the BVI. We do this by taking the interquartile mean of the last 150 points.
- Next we calculate an exponential moving average of the last 150 points, to get the final value for the BVI.

6. Weight the 5 different numbers according to the size of the market on each exchange.

Governance of VolCoin and Staking

When the volatility of Bitcoin rises the underlying index underpinning VolCoin BVI will go up and this price is linked to the price of VolCoin in the underlying code. We aim to have a treasury which can be tapped into to provide liquidity in the market should the natural market be unable to provide this. If three are insufficient VolCoins in the market to meet demand then more will be minted and sold. If there is a lack of orders on the offer then we will use the treasury supply of USDC to meet demand.

When Volatility goes down the underlying index, BVI, will go down in price and as it is linked to the price of VolCoin, this will also go down in price as well. If there are insufficient bids in the market the treasury will look to supply more VolCoin in the market by minting more VolCoin, via a minting process. But if there are insufficient offers in the market for people to sell their VolCoin into USDC then the treasury will supply liquidity into the market to make this possible.

Ultimately we aim to get to a place where there is sufficient trust in the market for VolCoin and the BVI that there will be little need for any sort of governance in the liquidity of the coin. We will look to help this by instructing market makers at the start to insure there is sufficient liquidity in the market at all times.

GVolCoin the protocols governance coin will allow holders to propose, vote on, and make changes to the parameters of the network. Staked GVolCoin will receive 40% of the transaction fees, SVolCoin (staked VolCoin) will receive 40%, 10% will be kept in the treasury and 10% will be used as funding to maintain the platform. In addition GVolCoin holders will also benefit from any VolCoins which are newly minted to meet demand and will receive 30% of the rewards, with the remaining going to the treasury.

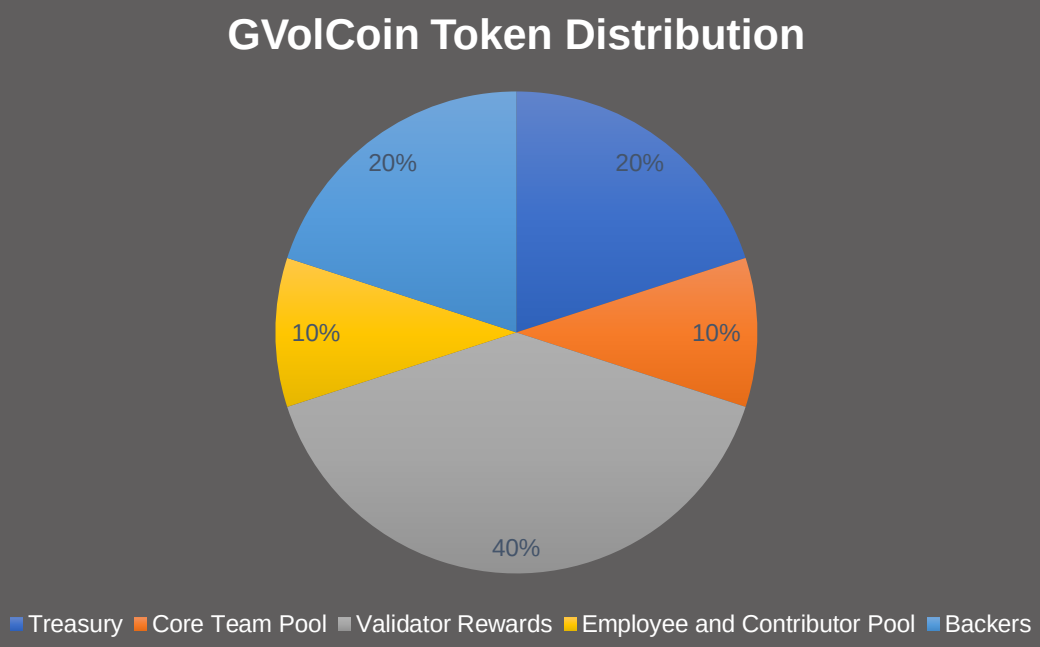
We will look to capitalise VolCoin with 522.8 USDC per VolCoin. The highest recorded volatility on the Deribit DVOL index is 130.75. So by being 400% over the highest recorded known volatility in the market we believe we will have adequate capital to cover any black swan events. Synthetix, one of the most successful DeFi protocols around has been designed in a similar way which is why we have chosen such a large cap ratio. Although this may be raised or lowered in the future through community governance mechanisms.

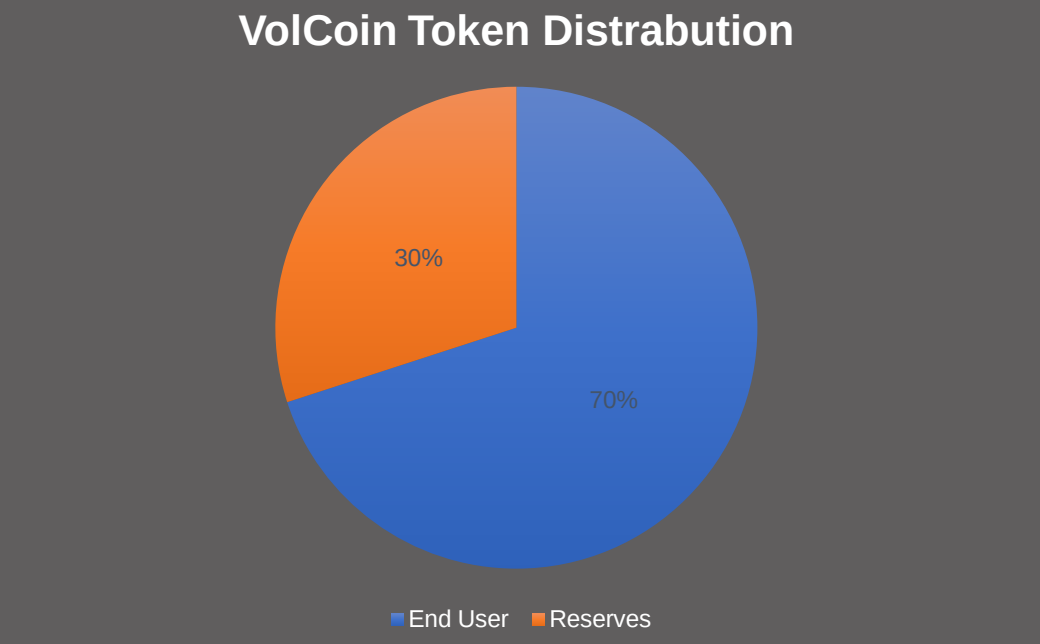
We will also look to allow ETH as a form of collateral meaning traders can borrow VolCoin against their ETH and begin trading immediately rather than having to sell their ETH.

Staked holders are incentivized to stake their GVolCoin and VolCoin tokens in two main ways.

1. Exchange rewards (fees from transactions on the platform). Each trade generate an exchange fee that is sent to a fee pool, available for GVolCoin and SVolCoin holders to claim each week.
2. VolCoin staking rewards which comes from the protocol's inflationary monetary policy. VolCoin inflationary system is derived from a target staking ratio. The target ratio for staking VolCoin is 80%, the inflation is adjusted up or down by 10% depending on whether the staking ratio is above or below the target ratio to incentivize stakers to hit this target. These GVolCoin tokens are distributed to VolCoin holders provided they lock their tokens in for two weeks. This also ensures the major users of VolCoin have a voice on how the protocol should be run.
3. GVolCoin holders will also receive 30% of the rewards received from minting newly generated VolCoins to meet demand.

Token Distribution Charts





The reserve of VolCoin will be kept in case VolCoin is trading too high and the price needs to be pushed down. Any money made will be kept in the treasury. All other VolCoins will be held by the end users and new VolCoins will only be created if there is sufficient demand.

Fund Raising

VolCoin requires significant funding to develop, launch, and grow the VolCoin network. We must develop all the software required: the mining software, the client software, user interfaces and apps, network infrastructure and monitoring, software that third-party wallets and exchanges need to support VolCoin, integrations with other data storage software,

tooling for web applications and dapps to use VolCoin, and much more. We must deploy the network, facilitate its growth to large scale, market to and onboard miners and clients, bring key partners into the ecosystem, and much more.

We are currently looking for strategic advisors. Individuals and organisations who can help build the VolCoin network, who will make strong long term commitment to the future and/ or present very significant opportunities for the network. In order to secure their long term commitment we are offering vesting/discount options of 1-3 years and 0-30% discount. This will be 2x larger than the public sale minimum vesting period).

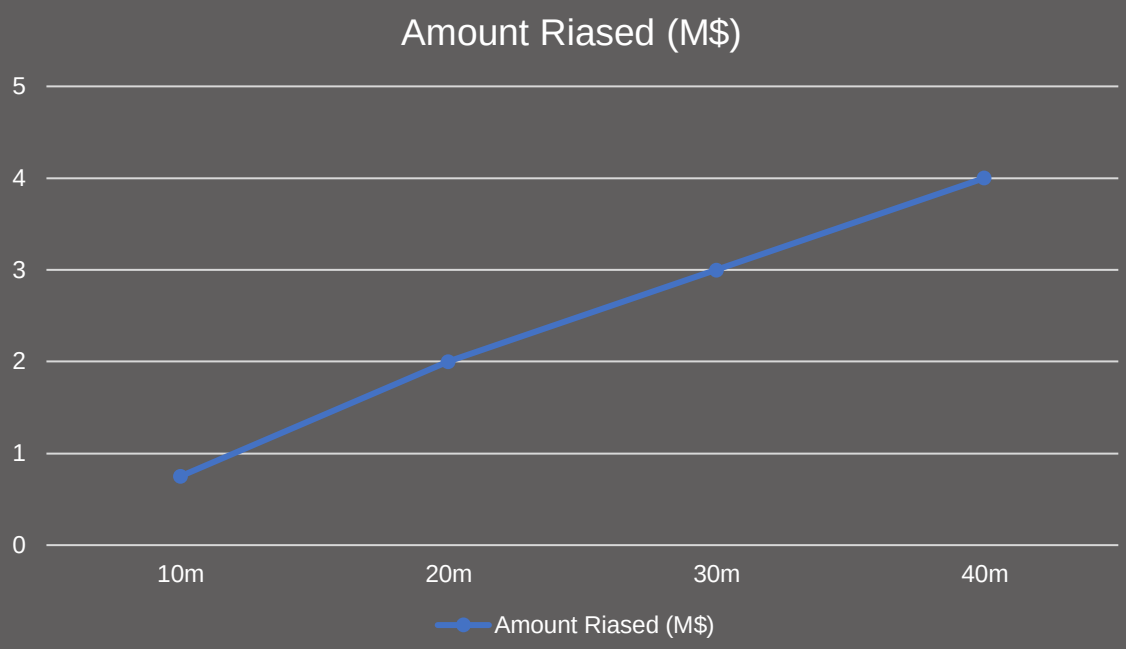
Through a token sale we hope to bring together a large and diverse group of investors from around the world, who want to work closely with us to build a mechanism to protect investors from bear markets, while at the same time grow and develop the crypto industry. We primarily seek strategic investors who have something high-value and unique to offer to VolCoin. We also wish to reach as broad of an investor base as we can; we want people and organizations from countries all over the world, who work in many different kinds of industries. We want our investors to represent many different groups so that VolCoin can quickly come to serve those users and spread across these networks. We want investors who add value, investors who will work with and for the network. We want investors who will share their skills, their knowledge, and their networks to achieve our success. We have structured the token sale to reward a large group of people that can help us build the network, by selling GVolCoin at what we think is a much lower price than it will be worth some day (caveat: as with any risky investment of course we cannot make guarantees or predictions).

We are aiming to list on CoinList with Instrument: GVolCoin once we have created the Vol Index and VolCoin.

The planning structure of the token sale to investors and the general public is outlined below;

- Increasing Price: as investments are made, the price increases along the Price Function
- Advisor Sale Price: $0.75 USD/GVolCoin for all
- Public Sale Price Function: price = max($1, amountRaised / $10,000,000) USD/GVolCoin
- Sale Cap: 200,000,000 GVolCoin (unknown how much in $USD, as discounts affect totals)
- Sale Timeline: TBC. Dependant on current bear market and

$$\text{Price} = \max\left(\$1, \text{amountRaised}\frac{amountRaised}{10{,}000{,}000}\right)$$



- For members of the VolCoin core team, they will only be able to sell 10% of their original holding every 6 months. Meaning that the majority of the core teams initial 10% will be locked up for at least 2.5 years.
- Investors from the ICO will be forced to vest for at least 6 months.

Economics of a VolCoin Transaction

Any transaction made on the network will incur 0.3% fee and will be distributed as such; GVolCoin will receive 40% of the transaction fees, SVolCoin will receive 40%, 10% will be kept in the treasury and 10% will be used as funding to maintain the platform.

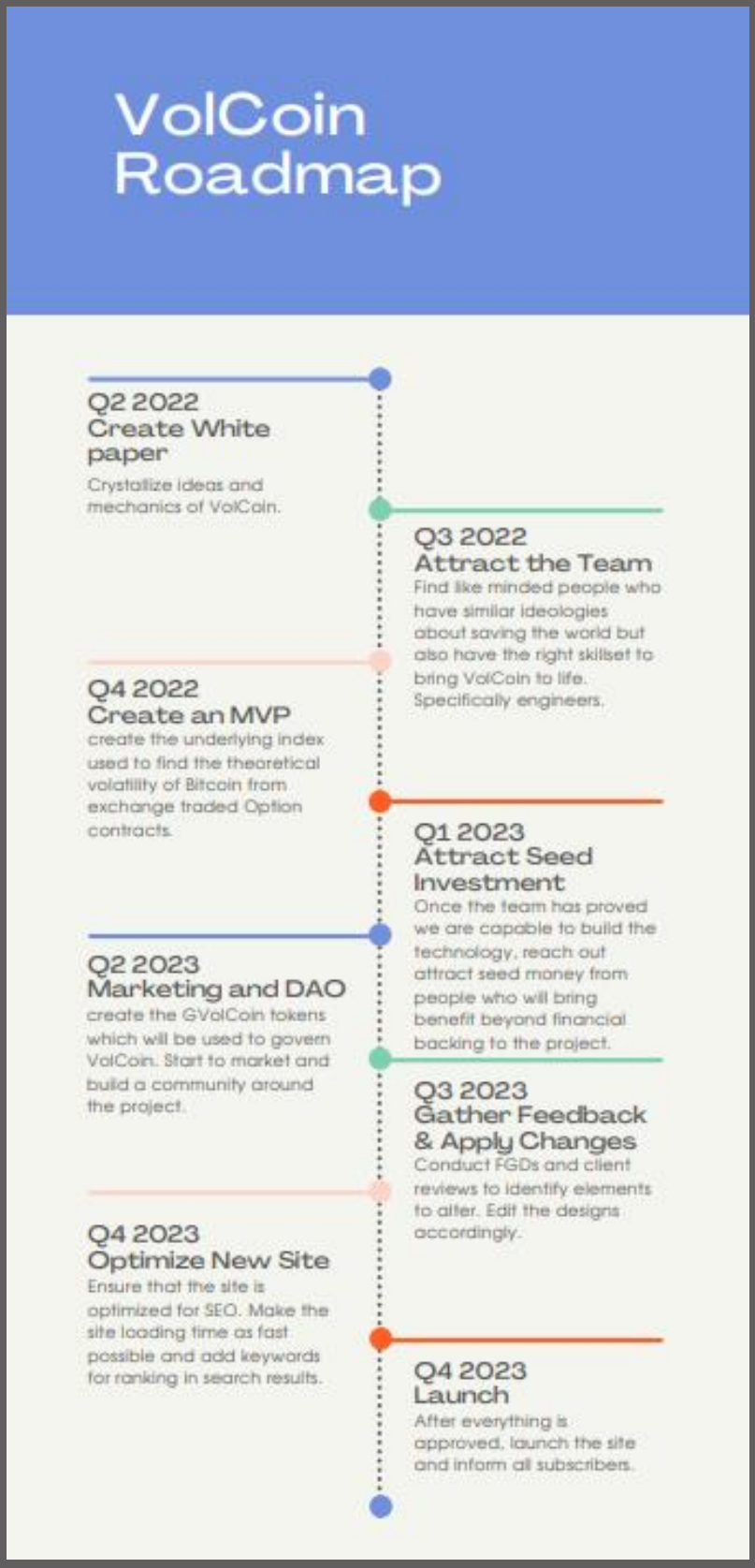
Project Budget

Funds raised during the Contribution Period will be used solely for the development and benefit of the VolCoin network. The level of funding received dictates the distribution of funds, however, our reserve structure allows us to reduce the volatility along the way towards achieving our long term objectives.

- 50% will be spent on core development, building the web3 website and underlying blockchain technology.
- 15% will be spent on Security. The foundation of what we're building rests upon security of the Status client. We are commencing the first of a series of security audits beginning in Q3, and each new major feature introduced will require an additional audit, before considering Mainnet deployment.
- 15% will be spent on marketing. Given the status of the market we anticipate our marketing budget to be smaller than many technology companies as the functionality is in high demand. This will cover ongoing community building events and reaching the general public via traditional marketing channels.

- 10% will be spent on day-to-day operations to ensure the organisation is running smoothly. As we expand a greater focus will be placed on processes and hiring new personnel.
- 10% Will be spent on Legal. Compliance is key to the long term success and our budget allocated to legal costs ensures that we fit within regulatory parameters.

Roadmap


VolCoin
Roadmap
Q2 2022
Create White paper
Crystalize ideas and mechanics of VolCoin.
Q3 2022
Attract the Team
Find like minded people who have similar ideologies about saving the world but also have the right skillset to bring VolCoin to life. Specifically engineers.
Q4 2022
Create an MVP
create the underlying index used to find the theoretical volatility of Bitcoin from exchange traded Option contracts.
Q1 2023
Attract Seed Investment
Once the team has proved we are capable to build the technology, reach out attract seed money from people who will bring benefit beyond financial backing to the project.
Q2 2023
Marketing and DAO
create the GVolCoin tokens which will be used to govern VolCoin. Start to market and build a community around the project.
Q3 2023
Gather Feedback & Apply Changes
Conduct FGDs and client reviews to identify elements to alter. Edit the designs accordingly.
Q4 2023
Optimize New Site
Ensure that the site is optimized for SEO. Make the site loading time as fast possible and add keywords for ranking in search results.
Q4 2023
Launch
After everything is approved, launch the site and inform all subscribers.

Conclusion

While the VolCoin team is near the start of their journey, this document proves we have the adequate knowledge and research of the market and protocol structures to make a successful crypto currency coin which we hope will bring more money into the ecosystem for everyone to benefit from.

Future Development

We hope to bring other volatility indices to this novel way of trading. With a volatility index on each major layer 1 protocols tracing the volatility of the major coins (Solana, Avax, Cosmos etc.)

We also hope to disrupt the current volatility index trading mechanisms and have equity tracked volatility coins as well as new volatility coins for established markets like property and gold.

Contact

Website – www.VolCoin.io

Discord – VolCoin Discord

Twitter – VolCoin Twitter