

LSTfi Report:

The Ultimate Q4 2023 Market Overview

* Ethereum focused

LSTfi protocols



EigLayer
Restaking








x Inactive

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Find out where PoS goes next at the [Staking Summit](#), join in person or [stream](#) the event live

1 Key Takeaways

-  Liquid staking is the largest DeFi category in terms of Total Value Locked (TVL), amounting to \$22.4B per DeFiLlama, with over 92% related to Ethereum.
-  Liquid staking protocols issue tradable digital assets in the form of Liquid Staking Tokens (LSTs). They offer a convenient way for users to participate in cryptocurrency staking without the complexities of running validator nodes and hardware management.
-  LSTfi, a subset of decentralized finance (DeFi), leverages liquid staking tokens such as stETH, rETH, WBETH, or cbETH for innovative yield strategies maximizing returns.
-  The diversity of this sector is impressive. From the liquid staking leader Lido and decentralization maxis such as Rocket Pool, through centralized entities Coinbase and Binance, to the astonishing variety of lending and earning platforms, stablecoins, indexes, and yield aggregators.
-  Blockchain Oracles are the backbone of LSTfi by ensuring accurate data securely to DeFi applications. Oracles' price feeds are instrumental for collateral valuation.
-  The concept of restaking has the potential to reshape the crypto-economic security, and more broadly the DeFi landscape by offering greater accessibility, trust assurances, and economic opportunities. EigenLayer shows the way for the sector, trying to manage the risk of validator slashing, misalignment of economic incentives, black swan ripple effect, and operational challenges.
-  The primary question around LST protocols revolves around centralization since Lido controls 31.4% of the market. New LST protocols cite decentralization as the primary goal for ETH staking. The new entrants allow users to deposit Lido's stETH. Once these projects launch on the mainnet, they swap the underlying stETH for the protocol's native version of staked ETH. This process is commonly referred to as a "vampire attack".

Featured Projects and Organizations

RedStone, as the author of the report, would like to express true gratitude to all the contributors, projects, and key opinion leaders who helped us create such a comprehensive piece on the LSTfi market. The depth and breadth of this report would not be possible without these individuals – thank you Kimberly & Teun from Coindesk Indices, Adam & Mirko from Staking Rewards, Soubhik & Sreeram from EigenLayer, Jakov Lido DAO contributor, Nick from Rocket Pool, Nader from Frax, Daniel from Swell, Jordan from StakeWise, Mike from EtherFi, David from Alluvial, Elias from Rated Labs, Raul from Diva Staking, Anton from Pendle, Josh from Sommelier, Seb from Instadapp, Sushant from Tapio, Rhett from Gravita, Sam from Liquity, Dorde & David from Raft, Richard & Stan from PrismaDAO, Michael from Origin, Ed from Mantle, Luffy from CIAN, PinkPunks from Lybra, Corn from Yearn Finance, OverKoalafied from Alchemix, Conor from Enzyme, Brad & Danny from Venus, Matt from Synthetix, Alison from PoSA, Amir & Christina from Puffer, Wolf from Warp Contracts, and many others!

LST Protocols & CEXes	Earning Platforms	LST-backed Stablecoin	Indexes	Staking-related Organizations	Lending	Restaking & Liquid Restaking
Lido (LDO) stETH & wstETH	Sommelier (SOMM)	Lybra Finance (LBR) eUSD	Enzyme (MLN)	Staking Rewards	Spark Protocol (SPK)	EigenLayer
Rocket Pool (RPL) rETH	Instadapp (INST) IETH	Gravita Protocol GRAI	Origin (OGN) OETH	Coindesk Indices CESR	Silo Finance (SILO)	Astrid Finance
Binance CEX (BNB) BETH & WBETH	CIAN	Raft (RAFT) R	Index Coop (INDEX)	Rated Labs	Alchemix (ALCX) aETH	Puffer (PUFI) pufETH
Frax Finance (FXS) frxETH & sfrxETH	Equilibria (EQB) & Penpie (PNP)	Curve Finance (CRV) crvUSD	unshETH (USH) unshETH	Proof of Stake Alliance	Aave (AAVE)	
Coinbase CEX (COIN) cbETH	Flashstake (FLASH)	Prisma Finance (PRISMA) mkUSD			Compound (COMP)	
Stader (SD) ETHx & MaticX	Yearn Finance (YFI) yETH	Ethena USDe			Venus (XVS)	
Swell (SWELL) swETH	Asymetrix Protocol (ASX)	Liquity V2 (LQTY) LUSD			Radiant (RDNT)	
StakeWise (SWISE) osETH	Tokemak (TOKE)					
Liquid Collective LsETH	Tapio Finance tapETH					
Ankr (ANKR) ankrETH	Synthetix (SNX)					
Ether.fi eETH						
Diva Staking (DIVA) divETH & wdivETH						
Mantle (MNT) mETH						
StakeHound (inactive)						

* Table presents projects with their LSTs or LST-backed tokens by default, in no particular order. Coin tickers in brackets contain other types of tokens, i.e., governance or utility tokens (if they exist).

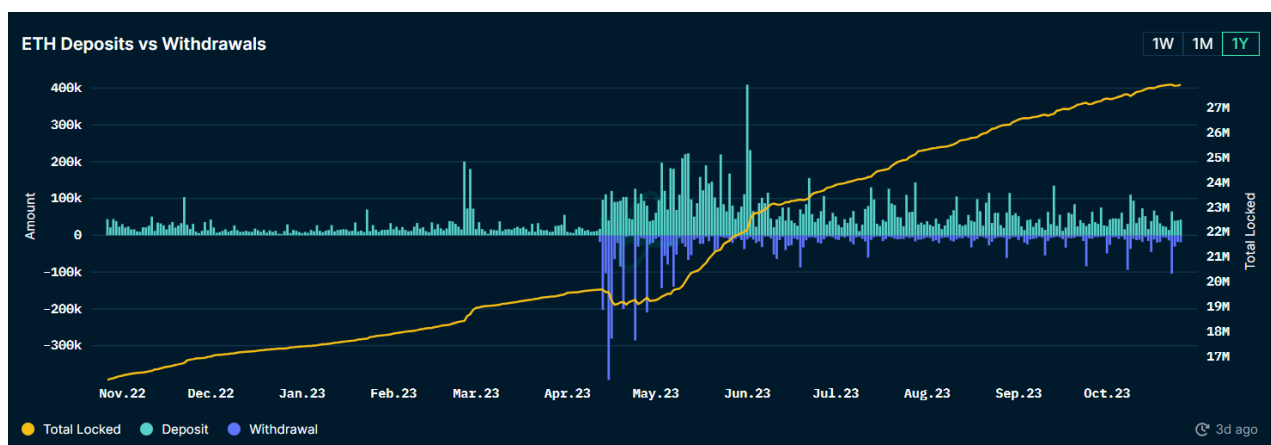
2 What are Liquid Staking Tokens?

Liquid staking token (LST) is a crypto-specific term that can be hard to grasp at the first sight. But it is an expression of a fundamental DeFi ecosystem building block. In brief, the following describes the LST characteristics:

1. Liquid staking tokens are utility tokens issued upon the network's cryptocurrency staking, i.e., stETH is an LST issued by Lido software upon ETH staking on the Ethereum network.
2. The fundamental purpose of LST is to unlock the liquidity of funds in a staking system. Investors can simultaneously earn staking yield and maintain LSTs' tradeability.
3. LST finance (LSTfi) exploded after Ethereum's Shanghai upgrade (12th April 2023), which enabled staked ETH withdrawals. LSTfi is nothing else than LSTs' use in DeFi.
4. LSTfi amassed an enormous Total Value Locked (TVL). Beyond the demand from decentralized protocols, both institutions and CEXes demonstrate a significant interest in regular and liquid staking.

Before we delve into LSTfi, let's make a short liquid staking introduction. The concept emerged when DeFi contributors and users realized staking alone comes with capital inefficiencies. Proof-of-stake blockchains (PoS) operate on validators who hold a certain amount of native tokens and ensure security. They must lock collateral. Some blockchains, such as Cosmos-SDK chains, offer individual investors the option to stake via delegated proof-of-stake (DPoS). Although validators and delegators benefit from obtained rewards, their capital is frozen out temporarily. Hence, projects started working on solutions to solve resource inefficiency problems. It is how liquid staking came about.

Ethereum's switch from proof-of-work to proof-of-stake, called [The Merge](#), concluded on 15 September 2022. That transformation process consisted of a few stages and initiated the innovation spiral. The Ethereum Beacon Chain launch was a major step. It introduced staking to the Ethereum network, and people could start locking their ETH. Initially, staked ETH was not subjected to withdrawals. Users' funds were inaccessible until the Beacon Chain merged with the mainnet, [The Merge](#), and later [Shapella upgrade](#). The chart below shows deposited and withdrawn ETH from a staking contract. As observed, the total value increases constantly. Over 28 million ETH staked currently corresponds to 23% of the total supply.



Deposited and withdrawn ETH from staking contracts (Source: [Nansen](#))

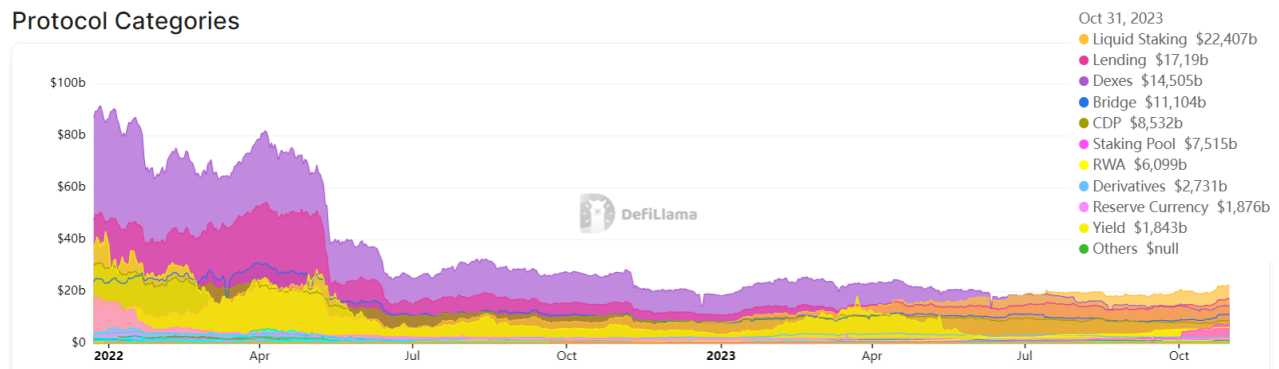
The process of liquid staking addresses obstacles regarding individual staking requirements. Initially, to become a validator, i.e., on the Ethereum network, participants must provide 32 ETH (about \$57k at the time of writing). It is a substantial investment threshold, not to mention the operational costs of hardware and cloud services required to run a validator node. Thanks to LSTs, people can share staking rewards without committing thousands of dollars in capital. They can contribute as little as they wish (within protocols' limits). It is what made liquid staking so successful.

In the meantime, protocols wanted to enable ETH liquidity. The first to do it successfully at scale was Lido. Since then, liquid staking has grown to be the decentralized finance leading sector with a combined TVL of \$22.4B (based on DeFiLlama data). Nowadays, liquid staking is a standard in the crypto space. Networks and tokens offering solely locked staking or illiquid solutions without derivatives will not cut it in the competitive market. The lack of additional utility hinders DeFi usability and projects' growth.

Liquid staking tokens, which used to be inadequately called liquid staking derivatives (LSD), enable earning yield on native tokens while ensuring tradeability. A receipt is a well-known comparison for LST. It represents the ownership of staked digital assets. In addition, LST and its issuing protocols allow anyone to partake in ETH (or different PoS blockchain) staking. In the traditional approach, profiting from staking involves securing a spot in the validation pool, running a node, which requires managing both hardware and software operations, and providing collateral in the network's currency. Liquid staking protocols take all of the responsibilities for the end user. Users' tokens secure the network, earn them rewards, and they still have liquid cryptocurrencies that can be utilized in DeFi. It is a win-win-win situation, as long as all the systems work properly (more on risks further in the report).

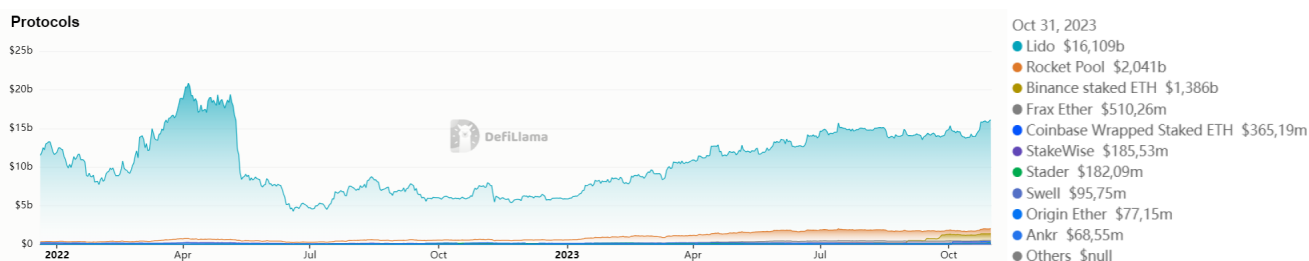
LST protocols took DeFi by storm. Liquid staking is accountable for 32.5% of decentralized finance TVL. The top DeFi application by TVL is Lido, overtaking the second MakerDAO by \$8B. It shows the scale and popularity of liquid staking tokens. The chart below presents the growth of the liquid staking industry compared to other categories. Since 2022, decentralized exchanges and lending have taken a massive hit regarding the accumulated value. In 2023, while different sections of the DeFi landscape have decreased in TVL, liquid staking has sustained its expansion.

Protocol Categories



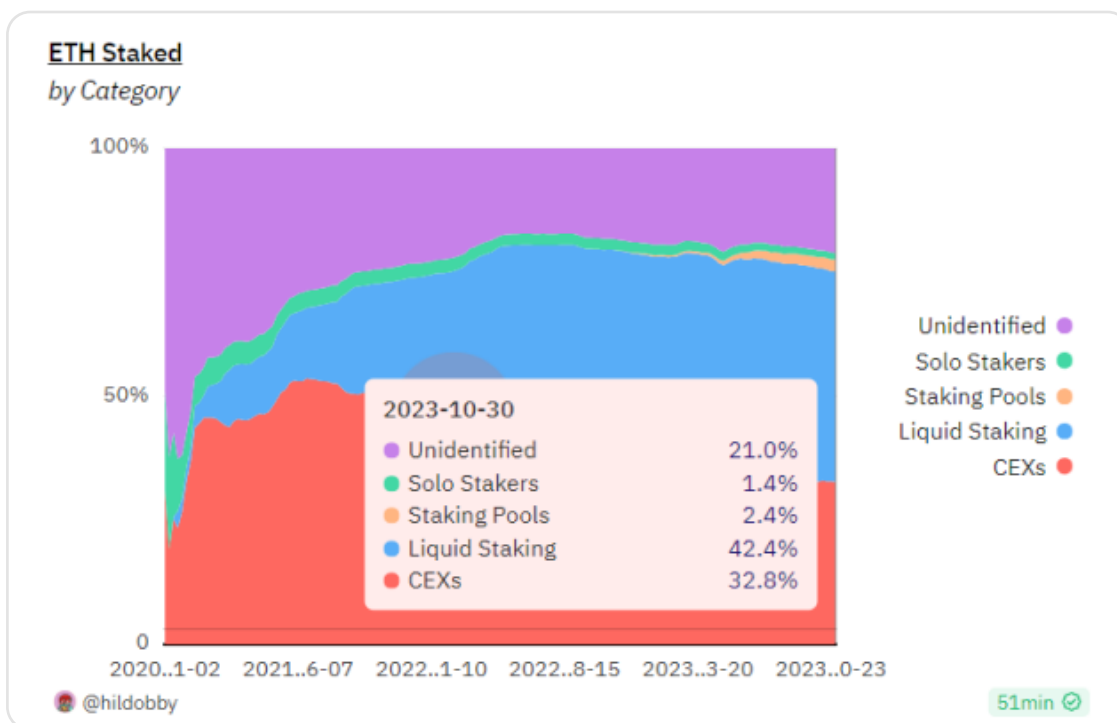
DeFi Categories by TVL (Source: [DeFiLlama](#))

The scene of liquid staking tokens is very rich. LST includes decentralized and centralized approaches. DeFi solution leaders incorporate protocols such as Lido, Rocket Pool, Frax, StakeWise, and Stader. Their operations revolve mainly around ETH. Liquid staking on the second-largest blockchain in terms of market capitalization (following Bitcoin) has no close competition so far. The largest CEX players, whose users are big ETH holders, also do not want to miss the occasion and prepare centralized alternatives. For example, Coinbase and Binance introduced their own LST versions. The TVL breakdown of the top protocols is displayed below. The dominance of Lido looks overwhelming. The project achieved it by the first mover advantage and continuous protocol's resilience in the turbulent market. The same applies to Uniswap in DEXs or Aave in lending.



Market share of particular LSTs (Source: [DeFiLlama](#))

The crypto market offers multiple staking solutions. The main categories include liquid staking, CEX staking, solo staking, and staking pools. For ETH, liquid staking leads the charge with a 42.4% market share. Its dominance has been growing at the expense of centralized exchanges.



ETH staked distribution by category (Source: [Dune](#))

Non-liquid Staking Providers and Staking Pools

Staking providers and staking pools play a vital role in crypto yield generation as well. They are strongly involved in the infrastructure, managing and running nodes. These organizations usually operate in a service provider way. Users dedicate their assets, i.e., ETH, and providers manually stake them (without issuing LSTs). Entities like that attract many users. They take care of staking overhead and hurdles, offering at the same time attractive rewards and options to safely allocate larger amounts of ETH. Especially, the institutional clients who do not want to be associated with any exchange or are still unconvinced about DeFi. The table below shows some of the most renowned and popular operators.

Non-liquid Staking Providers & Staking Pools		
Obol	Chorus One	Tenderize
SSV Network	Figment	Luganodes
Kiln	Staking Facilities	Stakefish
Stakin	P2P.org	SafeStake
Allnodes	Everstake	InfStones

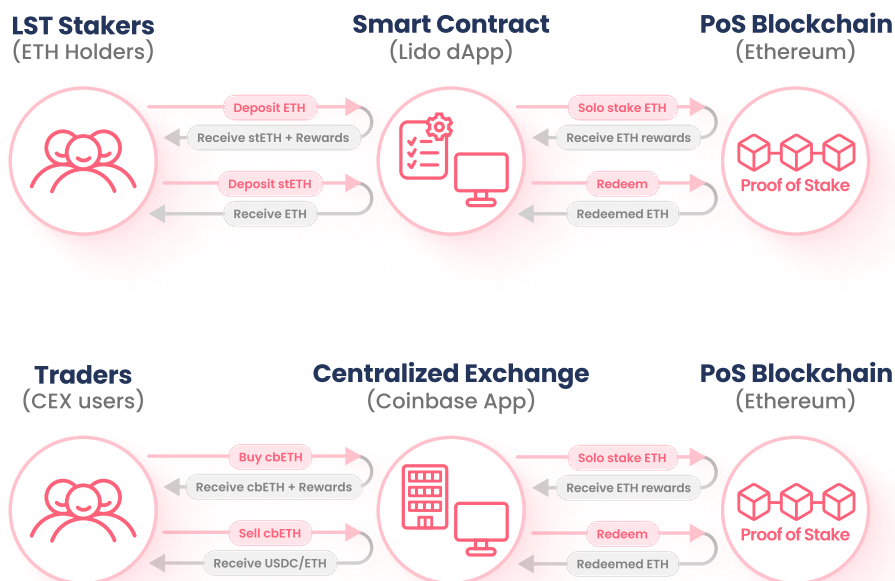
List based on [Staking Rewards providers page](#) and independent research

The LST Types

Staking providers and staking pools play a vital role in crypto yield generation as well. They are strongly involved in the infrastructure, managing and running nodes. These organizations usually operate in a service provider way. Users dedicate their assets, i.e., ETH, and providers manually stake them (without issuing LSTs). Entities like that attract many users. They take care of staking overhead and hurdles, offering at the same time attractive rewards and options to safely allocate larger amounts of ETH. Especially, the institutional clients who do not want to be associated with any exchange or are still unconvinced about DeFi. The table below shows some of the most renowned and popular operators.

Governing Systems

A Simplified Ethereum LST Flow With Protocol vs CEX



The LST ecosystem can be segmented in a few ways. Firstly, liquid staking platforms can be divided into decentralized and centralized solutions. Protocols like Lido, Rocket Pool, Frax, StakeWise, and Stader, aim to uphold the ethos of decentralization while also unlocking staked liquidity.

Centralized finance (CeFi) targets liquid staking as well. Exchanges attract users who value comfort and convenience more than sovereignty. They can directly stake tokens through CEX platforms without worrying about transferring assets to Externally owned account (EOA) wallets (CEX takes custody here). The following actions flow accordingly. Coinbase and Binance issue token derivatives to confirm staked assets ownership. They are both successful in terms of service popularity due to their large user base and simple, centralized processes. Consequently, BETH and cbETH are the third and fifth LSTs regarding the TVL, according to DeFillama.

LSTs Types by Governing System	
Decentralized LST	Centralized LST
Lido, Rocket Pool, Frax, StakeWise, Stader, Swell, Ankr, Liquid Collective, and many more.	Coinbase, Binance

LST Architecture Models

Furthermore, we can break down liquid staking based on the LST token design. There are three main distinguishable types and one secondary alternative. Each mechanism differs in reward distribution. What is crucial for the user is to get acquainted with the chosen derivative token architecture. It is better to be safe than sorry and familiarize yourself with the design before depositing high-value assets into a protocol. LST models are divided into the following categories:

1. Rebase tokens – tokens whose balance adjusts automatically based on deposits and rewards. Rebasing occurs periodically, usually once a day. Token holders will not see any transactional activity associated with the rebase. Lido's stETH and BETH from Binance fall into the rebase token category. It is a user-friendly LST type – your LST balance grows as you stake.

For example: staking 1,000 ETH at Lido will give you 1000 stETH, which after one week should amount to about 1,000.67 stETH (at today's 3.5% APR).

2. Rewards-bearing tokens – tokens that gain in value over time. The exchange rate between the derivative and the staked asset determines the pricing and earned rewards. The amount of LST remains the same, but the rate changes. It is also a convenient approach to LST rewards with a one-token model. However, it may not be as intuitive as rebase tokens. Similarly, if one holds such a token, regardless of the obtaining method, they benefit from the increasing rewards. Rewards-bearing tokens include i.e., rETH, cbETH, swETH, osETH, and ETHx.

For example: staking 1,000 ETH at Stader will give you about 989.78 ETHx that after one week will be the same amount of ETHx, but worth about 1,000.68 ETH (at today's 3.56% APR).

3. Wrapped tokens – some of the rebase LSTs have wrapped forms. Once wrapped, they stop undergoing automatic balance recalculations and become reward-bearing tokens. While rebasing happens without transactions, the balance modification of wrapped derivatives can only be performed through minting, burning, or transfers. Rewards are calculated within the exchange rate. Both stETH and BETH have their wrapped alternatives of wstETH and WBETH. Wrapped LSTs are usually more popular in DeFi and trading (have a higher volume), as they are not subjected to rebasing.

For example: wrapping 1,000 stETH at Lido will give you about 874.62 wstETH that after one week will be the same amount of wstETH but worth about 1,000.67 ETH (at today's 3.5% APR).

4. Dual-token model – is an LST design where one of the tokens maintains the 1:1 ratio to the staked asset, and the other represents the rewards. The protocol issues both tokens to stakers. The first one is backed by deposited cryptocurrency, and as long as users hold it, they are authorized to receive rewards. This separation can help mitigate risks associated with blockchain technology and exploits. StakeWise implemented a mechanism with two tokens with sETH2 and rETH2, and Frax frxETH and sfrxETH.

For example: depositing 1,000 ETH at Frax will give you 1,000 frxETH that can be staked. If you do so, you receive 1,000 sfrxETH, and after one week, you will still have 1,000 sfrxETH worth about 1,000.76 ETH (at today's 3.99% APR).

LSTs Types by Architecture Models

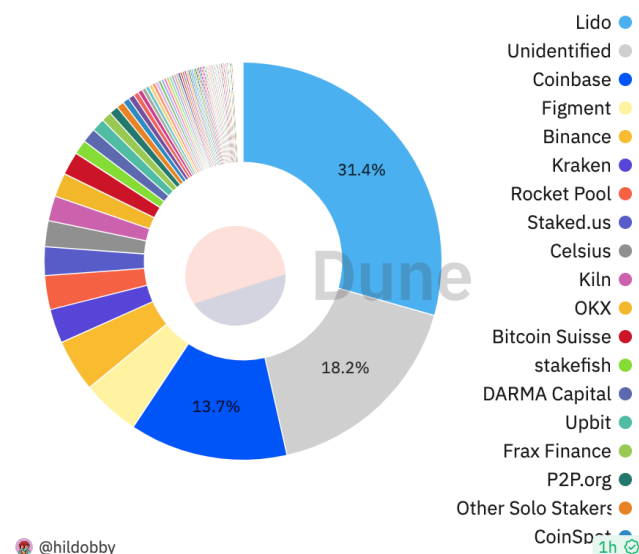
Rebase LSTs	Liquid Staking Tokens balance adjusts automatically daily	stETH, BETH, divETH, eETH
Rewards LSTs	LST exchange rate changes relative to the underlying asset over time	rETH, cbETH, swETH, osETH, ETHx, ankrETH, swETH, LsETH
Wrapped LSTs	Transformed version of the LST, usually from rebasing into reward-bearing	wstETH, WBETH, wdivETH, weETH
Dual-token LSTs	Staked asset is divided into two tokens, one is pegged to the underlying asset, the other accrues or depicts rewards	sETH2 + rETH2, frxETH + sfrxETH

3 Ethereum LST Protocols: Deep Dive

Before we dissect the LST protocols, let's make a short reminder. The liquid staking economy revolves mainly around Ethereum. Simple ETH staking caused capital inefficiencies. Hence, the bright minds of DeFi created tradeable derivatives. Simultaneously, ETH is being staked, securing the network and earning rewards while assets remain liquid. It transforms traditionally illiquid staked tokens, such as those used in proof-of-stake blockchains, into liquid, transferable assets, that can be traded or used as collateral in various decentralized finance applications. LST protocols are platforms utilizing smart contracts that enable this process by issuing receipt tokens in exchange for users' collateral. Currently, the LST industry leads the DeFi table regarding the TVL. Many jumped on the liquid staking train, including decentralized projects, centralized exchanges, and staking providers. The decomposition of ETH stakers is presented in the chart below.

ETH Stakers

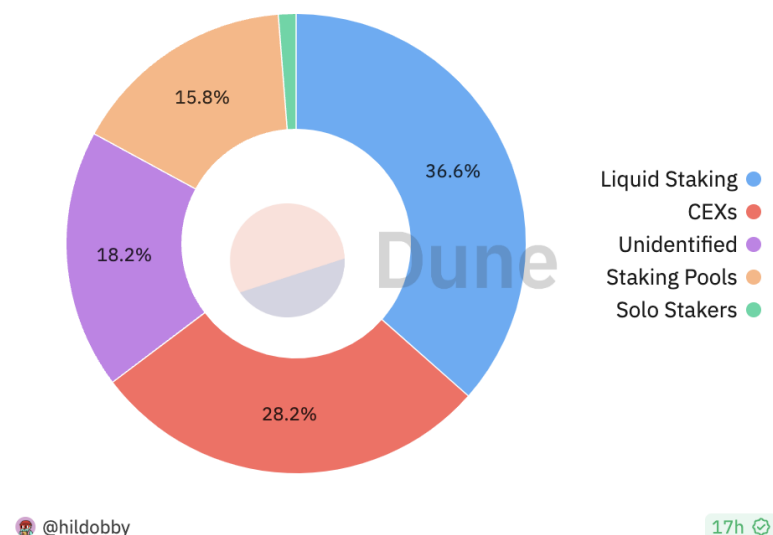
Ordered by Amount Staked



ETH Stakers distribution by percentage of all ETH staked (Source: [Dune](#))

The additional breakdown divides projects into adequate categories. LST protocols, exchanges, and staking providers battle for the ETH staking market share. The first one comes on top with a massive contribution from Lido.

ETH Staked Breakdown
by Category



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ETH Staked by Category (Source: [Dune](#))

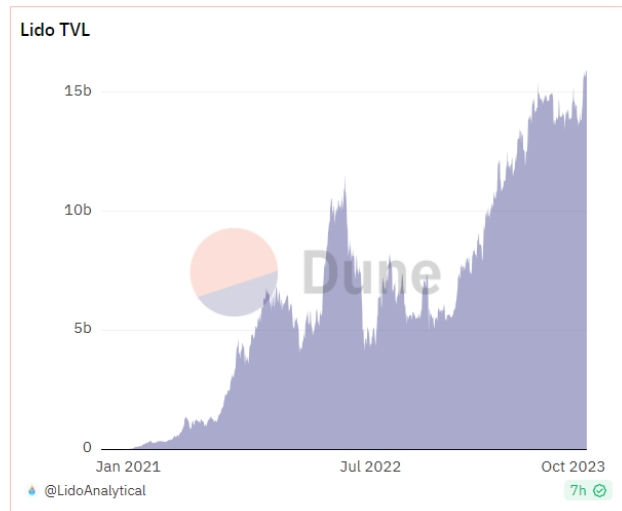
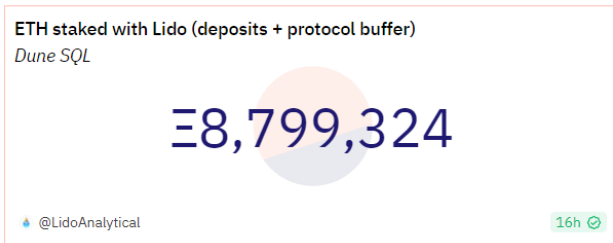
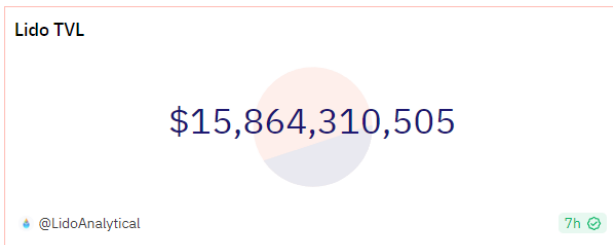
The LST Market Overview in Q4 2023

The LST ecosystem has grown extensively since the beginning of 2023. This chapter will focus on the most popular and innovative protocols. In the next chapter, the door to the LSTfi world will open. What is making DeFi projects fantastic to research is the availability of on-chain data and derived analytics tools.

Lido is the largest protocol regarding TVL and ETH deposited. Although it is a well-known destination in DeFi, the short description is due. Firstly, Lido started early and even pioneered LST solutions in crypto. They definitely benefit from the first-mover advantage. Moreover, they deserve credit for creating a user-friendly and robust staking flow. People can simply connect with their Web3 wallet, deposit ETH, and receive the liquid stETH. Users benefit from Ethereum staking rewards and get unlocked assets. stETH can be utilized in various LSTfi protocols, as presented later in the report.

Lido has two versions of its liquid staking token. stETH is a rebasing token that collects rewards daily through automated balance change. wstETH is a wrapped representation of stETH and is a non-rebasing, reward-bearing token. As mentioned previously, Lido's dominance in the LST market is unmatched. Their market share equals 31.4% of ETH staked.

Lido cares about data transparency with public Dune dashboards. Users can verify the total value locked, amount of deposited ETH, staking APRs, number of depositors, competitors breakdown, and more. Such details are unobtainable for the regular Joe in traditional finance. With Lido's analytics dashboard, investors can examine stETH's utilization in different DeFi applications such as Aave, MakerDAO, or Curve.



Statistics regarding Lido liquid staking (Source: [Dune](#))

Lido is famous for ETH liquid staking. However, it offers the staking for one more network, Polygon. Users can deposit MATIC, earn rewards, and maintain asset liquidity with stMATIC (no wrapped version). Until recently, Lido also offered liquid SOL staking. However, small interest and low revenue stream [led to winding down this solution](#), and the Solana native coin is no longer available.

For more interested users, Lido provides a [scorecard](#) where people can track the latest updates and the areas protocol needs to improve. The goal is to deliver a decentralized, trustless, governance-minimized staking solution. Lido divides the protocol's attributes into three categories based on performance and self-assessment. The classes describe spaces where the Lido team is succeeding, can improve, and needs improvement. Transparency like this is crucial in decentralized finance, even though it requires sharing weak aspects of the protocol.

"Lido DAO, a beacon of maturity in the world of DAOs. With a vibrant community and passionate contributors, it's a place where education and the pursuit of decentralization thrive, unveiling new opportunities for stakers. The elegance of Lido's software lies in its simplicity for users looking for staking middleware. Yet, those who seek deeper understanding of the software, will be impressed with the way Lido technical contributors managed to abstract complex mechanics which provide security and decentralization," said **Jakov Buratovic, Master of DeFi**.

[Rocket Pool](#) is a decentralized Ethereum staking protocol that addresses the challenge of illiquidity and the minimum collateral requirements. The protocol offers a solution that allows users to stake with less than 32 ETH and participate in proof-of-stake rewards. Staking with Rocket Pool is a straightforward process requiring only a cryptocurrency wallet like MetaMask and some ETH. Users can stake with as little as 0.01 ETH. Rocket Pool is the second liquid staking protocol in terms of TVL, according to Defillama.

Rocket Pool's liquid staking token, rETH, continually increases in value relative to ETH based on staking rewards. Users can mint rETH on the platform through a friendly UI or purchase rETH independently on DEXs like Uniswap. Simply holding it in their wallets entitles investors to accumulate rewards (since rETH value increases over time). The

rETH/ETH exchange rate is updated every 24 hours based on the rewards earned by Rocket Pool node operators.

$$rETH:ETH \text{ ratio} = (total \text{ ETH staked} + Beacon \text{ Chain rewards}) / (total \text{ rETH supply})$$

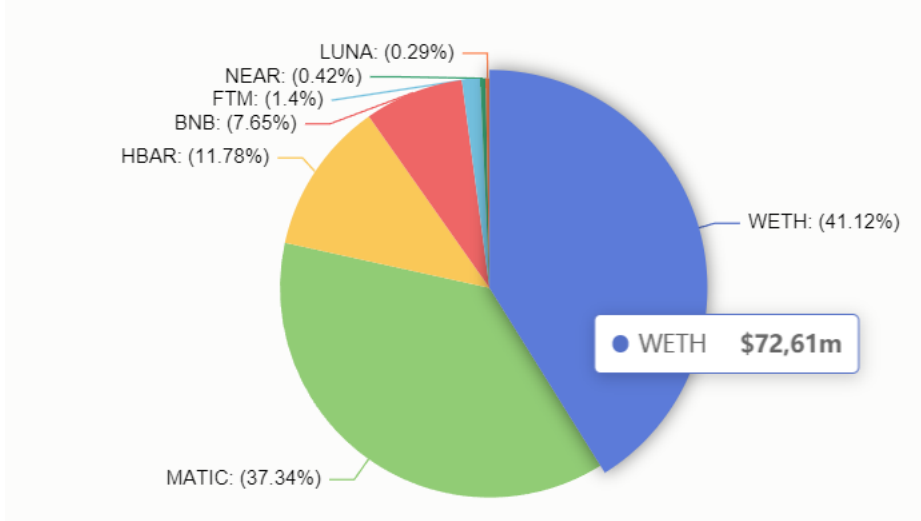
While trading rETH for ETH is possible directly through Rocket Pool, it depends on the availability of ETH in the staking pool, sourced from deposits by other stakers and ETH returned by node operators after receiving rewards. In certain cases, where the staking pool lacks sufficient balance, decentralized exchanges are an alternative method to swap rETH back to ETH, albeit possibly with a small premium.

Frax Finance is a versatile DeFi project. It offers multiple solutions, such as stablecoin (FRAX stablecoin), lending (Fraxlend), DEX (Fraxswap), and liquid staking (Frax Ether). The latter includes a dual-token mechanism with frxETH, a stablecoin pegged to ETH, and Staked Frax Ether (sfrxETH), which accrues staking yield. Profits from Frax Ether validators go to sfrxETH holders, creating a way to earn interest on ETH. To finish the puzzle, Frax ETH Minter (frxETHMinter) allows users to exchange ETH for frxETH, onboard ETH into the Frax ecosystem, and mint new frxETH tokens. This system streamlines Ethereum staking and integrates it into the Frax ecosystem, offering a simplified and secure approach to earning interest. In addition, Frax designed in-platform solutions to utilize sfrxETH directly.

Frax launched its liquid staking infrastructure in late 2022 and currently sits in fourth position regarding the total value locked with \$506M, according to DefiLlama. In 2023, Frax Ether recorded tremendous growth and now maintains a stable supply of ETH. Frax provides an overview and analytics where users can verify protocol details. Available data includes frxETH supply breakdown, TVL, rewards, number of validators, and treasury information.

Stader is another growing liquid staking protocol. Its smart contract-based platform provides convenient LST solutions. Stader's advantages are the supported network diversification and dedicated LST tokens (LSTx). Stader offers seven blockchains to choose from: Ethereum, Polygon, Hedera, BNB, Fantom, Near, and Terra 2.0. Previously, staking with the highest TVL on Stader was MATIC, but ETHx has had the most dynamic growth and is placed first now.

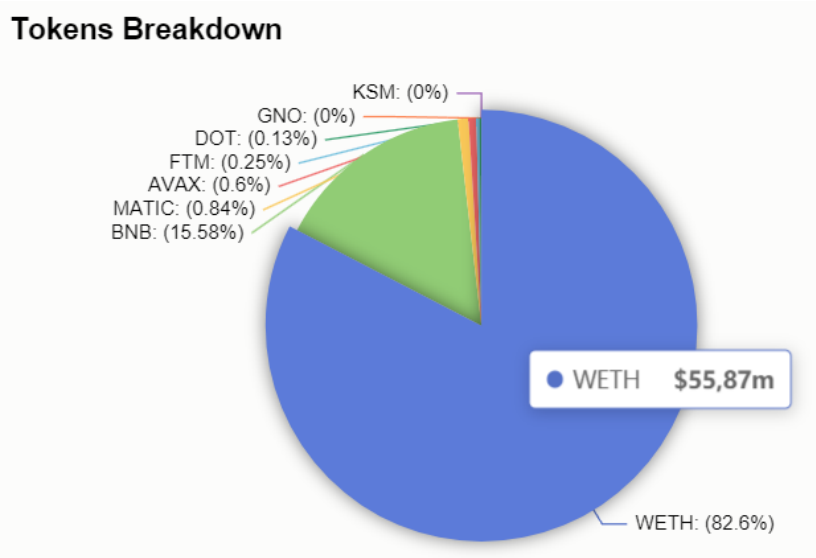
Tokens Breakdown



Statistics regarding Lido liquid staking (Source: [Dune](#))

Stader gathers many more users by offering multiple proof-of-stake networks. Investors with a diversified altcoin portfolio can become fond of their products. Stader is the all-in-one liquid staking platform for various cryptocurrencies. Deposited assets, e.g., ETH, are staked and split between permissionless and permissioned node operator pools. This design ensures scalability, decentralization, and optimized yield. ETHx is a reward-bearing token, increasing in value over time. It is noticeable in the ETH-ETHx exchange rate. Other products have the same mechanics. Rewards are restaked, increasing the final yield.

Ankr is a well-known infrastructure company in the crypto space. It provides various products and services for Web3, beginning with RPC/REST API and advanced API through smart contract automation and scaling services, ending with staking, liquid staking, and gaming. Ankr offers access to reward-bearing LSTs. The list of available collateral incorporates such assets as ETH, MATIC, BNB, FTM, AVAX, and DOT. The variety is impressive, as the selection includes networks with different architectures. Users utilize Ankr mostly for ETH liquid staking and mint ankrETH, but BNB has its devoted audience too.



Breakdown of tokens staked at Ankr (Source: [DeFillama](#))

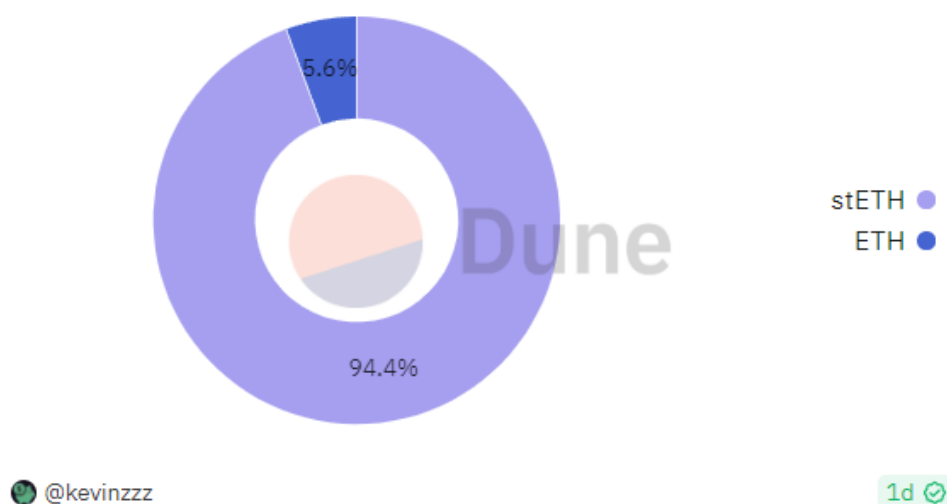
Diva Staking is another protocol entering the Ethereum liquid staking competition. Its novelty introduces the first solution that fully integrates liquid staking with Distributed Validation Technology (DVT). In essence, DVT refers to validator security, spreading key management, and signing responsibilities across multiple parties. This approach reduces single points of failure and increases validator resiliency. Diva's DVT brings significant advantages, reducing risks and improving performance. It lowers the risk of offline penalties, lost keys, slashing, and MEV stealing. It enhances economic conditions for stakers and node operators, optimizing for low latency and enabling fully trustless, permissionless participation in the network. In Diva's case, each validator is run by 16 DVT Key Shares. Standard Ethereum solo staking requires 32 ETH to set up a node. Diva operators must lock only 1 divETH as collateral per Key Share.

Diva is in testnet as of November 2023, but it conducts an early staker program for pioneering participants. Enzyme, an on-chain asset management system, operates two Early Staker Vaults, one for ETH and the second for stETH, both of which have been approved by Diva Staking DAO. To boost the liquidity and attract node operators before

the launch, Diva rewards preliminary stakers with DIVA tokens. Once Diva launches, all funds will get staked. The more ETH or stETH users deposit, the more DIVA tokens they will get.

Upon inception, Diva will provide two LSTs, divETH and wdivETH. Both versions accrue staking rewards with differences in the mechanism. divETH is a rebasing token with a balance changing automatically daily. wdivETH is a wrapped non-rebasing variation with a static balance. The rewards from wdivETH can be redeemed when unwrapped back to divETH. These two alternatives offer flexible methods for stakers to deposit their ETH and earn yield. Despite being on testnet, Diva has already accumulated almost \$32M in TVL. Most of the value is allocated in stETH, which makes Diva an LSTfi protocol as well.

Amount Decomposition Diva Early Staker



Breakdown of stETH vs ETH at Diva Early Staker program (Source: [Dune](#))

the launch, Diva rewards preliminary stakers with DIVA tokens. Once Diva launches, all funds will get staked. The more ETH or stETH users deposit, the more DIVA tokens they will get.

Ether.fi is a non-custodial staking protocol scheduled to launch the mainnet in November 2023. The team focuses on an all-around solution for ETH liquid staking, where stakers get to control their keys. Ether.fi will release liquid staking token eETH, in combination with the restaking concept and Loyalty Points system at its core. The protocol offers multiple ways to earn yield, relying on trusted node operators and solo stakers to run nodes.

Ether.fi just recently launched its liquid staking token - eETH. Users can engage in Ethereum staking, receiving tradable assets at their convenience. What is unique about Ether.fi is the fact that it builds eETH natively on EigenLayer, the pioneers of restaking (more on them later). eETH will be the first LST that is natively restaked on EigenLayer. The token will accrue both Ethereum staking rewards and restaking yields. This capability is exceptional among liquid staking protocols.

The ultimate goal of Ether.fi decentralization roadmap is to become the simplest and most accessible platform for staking and node operation. They aim to achieve permissionless participation in staking and node operation, ensuring a high level of decentralization in governance and contract stability. After the restaking integration, Ether.fi will focus on providing open-source software services and code, permissionless

solo staking, and DAO governance.

Liquid Collective, developed by Alluvial, finishes this section off. It is a fairly new protocol, launched in June 2023, focused on enterprise-grade liquid staking. Liquid Collective is designed to meet the needs of institutions. Existing LST issuers target crypto users and stakers. It is a place where innovation blossoms. However, for global adoption, liquid staking solutions must meet enterprise requirements. Liquid Collective seeks to solve challenges for big organizations by developing a protocol suitable for institutional stakers that offers deep liquidity and unified architecture. One of the conditions demands Know Your Customer (KYC) and Anti Money Laundering (AML) verification for users and operators.

Liquid Collective introduces reward-bearing LsTokens, starting with LsETH. The rewards are calculated daily and are automatically restaked while holding LsETH. Minting takes place on supported platforms such as Coinbase Prime, Figment, Bitcoin Suisse, Hashnote, and Twinstake. Liquid Collective is a vital link in overall crypto and staking adoption, helping institutions enter the LST market. Fortunately, Liquid Collective has not lost the DeFi principles in the process. They run a diversified node operator set spreading stake funds allocation. The protocol will be governed in a decentralized manner by a broad and dispersed community of industry participants. Liquid Collective presents itself as a full package combining DeFi capabilities with institutional requirements.

Mantle, previously known as BitDAO, has launched an L2 on Ethereum earlier in 2023. Their team plans to start the Mantle Liquid Staking Protocol (LSP), which will be a permissionless, non-custodial ETH liquid staking protocol deployed on Ethereum and governed by Mantle. The associated LST, Mantle Staked Ether (mETH), will serve as the rewards-bearing receipt token. The core team estimates that on the 15th November 2023 the permissionless mode of the protocol should open.

LST Innovation Cases: Swell & StakeWise

Whereas the LST space lacks no innovation, and users can benefit from new ideas, there are two protocols that we would like to highlight based on the recent growth and innovation angle.

Swell is a non-custodial liquid staking protocol that aims to simplify and gamify the staking experience while securing Ethereum's future. Their novel approach introduced the Voyage program, which incentivizes users from the early days to utilize their reward-bearing swETH across DeFi protocols. **The Voyage** is a series of activities and chapters that aims to distribute governance rights among early protocol members. Participants receive pearls, which will be redeemable for SWELL tokens. To earn them, participants must perform various actions, i.e., mint and hold swETH, provide liquidity in selected pools (Balancer, Aura, Maverick), engage in DeFi platforms (Sommelier, Pendle), or engage in growing the swETH user base. The Voyage is a fun and motivating experience to create a crypto community around Swell. The platform's security-first approach, and vetted node operators ensure a robust environment while minimizing barriers by offering no minimum staking requirements. However, withdrawals will be enabled in Q1 2024. Currently, users can swap swETH to ETH on DEXs.

“Swell is committed to driving step-change innovation in the exciting field of liquid staking. Core contributors are looking forward to continuing the execution on the ambitious roadmap ahead. This includes expanding collateralization use cases for swETH – a key initiative which is supported by RedStone’s Oracles feed services,” said **Daniel Dizon, Swell Founder.**

StakeWise was one of the very first non-custodial liquid staking solutions (on Ethereum and Gnosis), enabling users to access proof-of-stake yields while maintaining flexibility: unstaking at their discretion or utilizing their staked tokens for enhanced DeFi yields without minimum deposit requirements. They operate a robust, institution-grade infrastructure and implement a unique LST design to maximize rewards. Their dual-token design splits staked capital and rewards into separate tokens, sETH2 (staking ETH) and rETH2 (reward ETH), solving the capital dilution issues seen across single token models in the pre-Shapella environment. However, now the focus is on protocol’s imminent upgrade to StakeWise V3, viewed as a second-generation liquid staking protocol that improves upon the protocol designs first pioneered by StakeWise, Lido, and Rocket Pool.

StakeWise is expected to launch its disruptive V3 in November 2023. The upgrade introduces a versatile protocol design that unlocks additional utilities and use-cases to ETH staking. The third version will allow open participation for node operators, even solo stakers, who can mint new, less risky staked Ether token standard (osETH). Regular stakers will be free to allocate ETH to preferred node operators, while DeFi users can stake with protected osETH tokens. Institutions, custodians, and crypto exchanges will have the possibility to establish private mini-pools that create bespoke and highly-regulatory secure staking solutions, whilst still providing access to liquid staking via osETH tokens.

The essence of StakeWise V3 lies in the staking vaults. Anybody can set them up to offer trustless, non-custodial staking-as-a-service via an open marketplace and run nodes for others. Vaults accept delegations and give stakers the option to mint osETH, an overcollateralized staked Ether token, to turn their stake liquid. Importantly, osETH is a rewards-bearing token that accrues staking rewards, and its value increases over time. The additional LST design grants more flexibility to perform staking operations and to participate in the LSTfi ecosystem. For example, any entity capable of running their own nodes, such as solo stakers, will be able to mint osETH whilst staking on their own infrastructure. Unlocking liquid staking for such stakers marks a key step in the attempts to decentralize the ETH staking ecosystem.

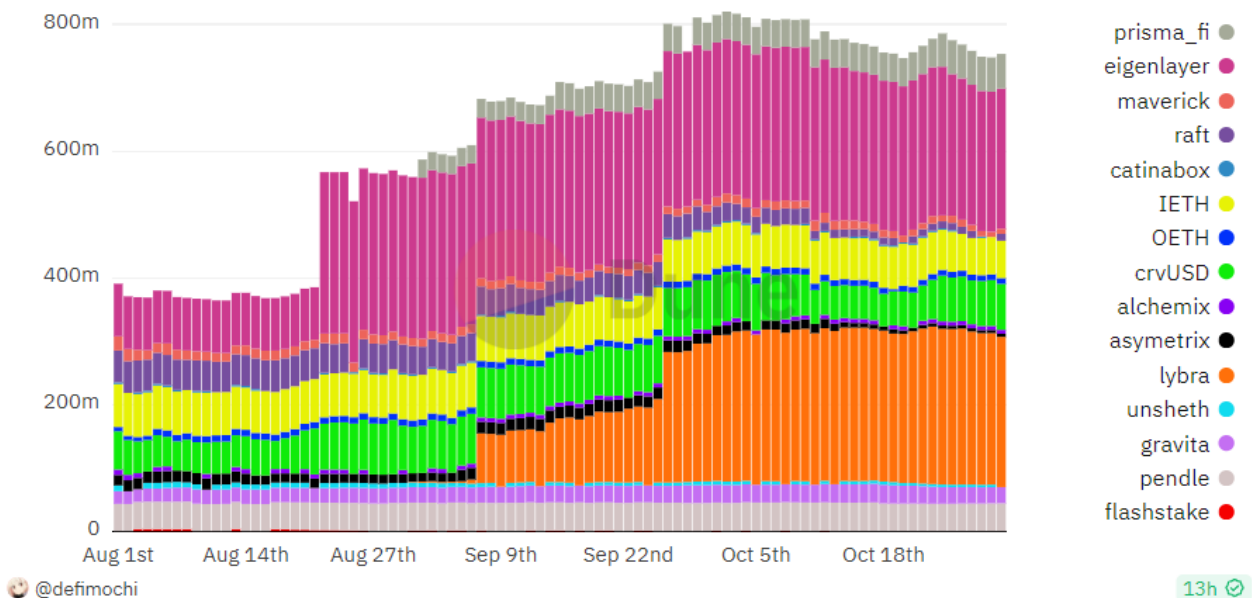
“Since announcing V3 back in September 2022, we have received overwhelmingly positive feedback on the design of the protocol and its potential. After a long development and testing phase, our team is excited to get V3 on Mainnet this year to showcase that it can move the needle on the current staking landscape,” said **Dmitri Tsumak, StakeWise Founder.**

4 What is LSTfi?

Decentralized finance based on liquid staking tokens is a branch of DeFi revolving around LSTs utilization and additional yield strategies. LSTfi emerged due to derivatives blooming. It can be treated as another level of crypto inception. The first step is that people who hold ETH want their assets to work and allocate them to staking. Okay, you have your LSTs still accruing staking yield. What now? The second step is to utilize these LSTs across DeFi, lending, liquidity providing, stablecoins, or even leverage trading. In other words, LSTfi exists to employ LST for further interest generation, falling deeper into the DeFi rabbit hole.

It is challenging to keep track of all LSTs deposited into DeFi. There is no precise dashboard accumulating the value of every liquid staking token on different platforms. However, the chart below presents the most accurate data available. In there, LSTfi market share accounts for only 1.1% of DeFi. Measuring error might occur when differentiating multi-purpose protocols like Curve to obtain LST-only data, but still, the fraction is small. TVL of LSTfi rounds up to \$787M. However, the ecosystem is rapidly changing, and the value locked can be subjected to volatile movements. What is fascinating, is the fact that almost no matter which LST you hold, there is a protocol that can provide additional earn opportunities. Bear in mind that increased leverage is associated with greater risk. Packaging derivatives into further protocols can expose capital to greater losses. Although teams try to ensure funds' safety and healthy collateralization levels, it does not exempt you from conducting research.

LSD TVL \$ [Market Share By Protocol]



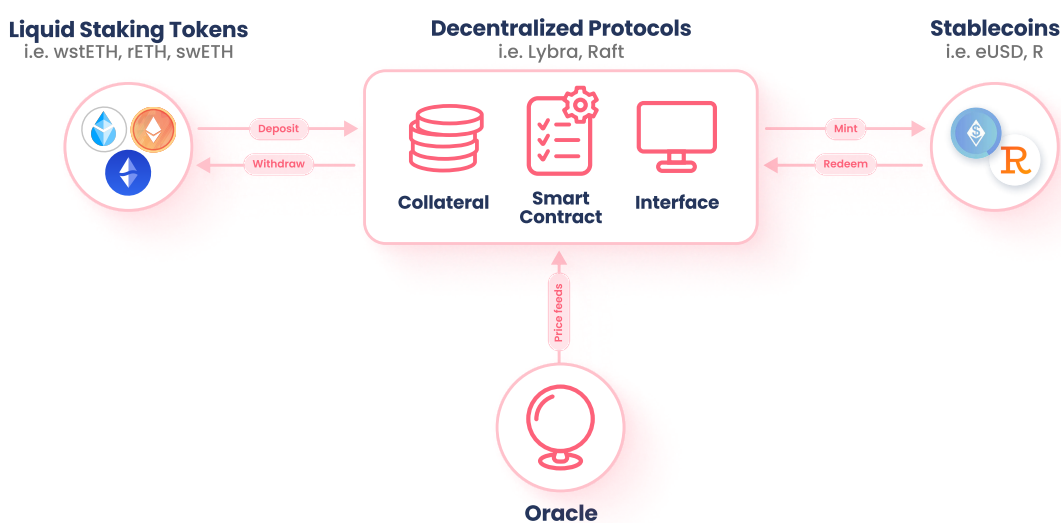
Breakdown of TVL by projects in the LSTfi category (Source: [Dune](#))

The Types of LSTfi Protocols

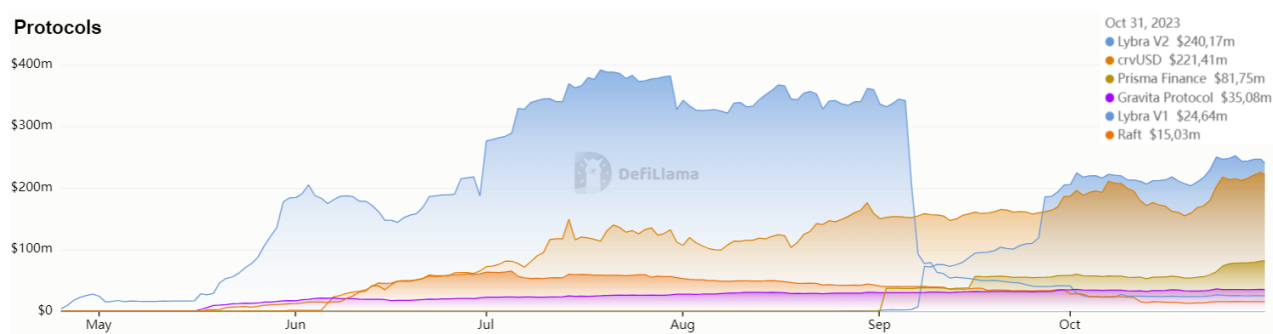
Because LSTfi introduces ways to utilize liquid staking tokens, it builds on and extends current DeFi applications. Categories of LSTfi protocols correspond with existing decentralized platforms. The only distinction we can observe is classification into projects that created tailored solutions specifically for LSTs and industry regulars who integrated LSTs into their services. Liquid staking token holders can use them in the following applications.

Collateral Debt Position Stablecoins (CDPs)

A Simplified Flow of LSTs Backed CDP Stablecoins

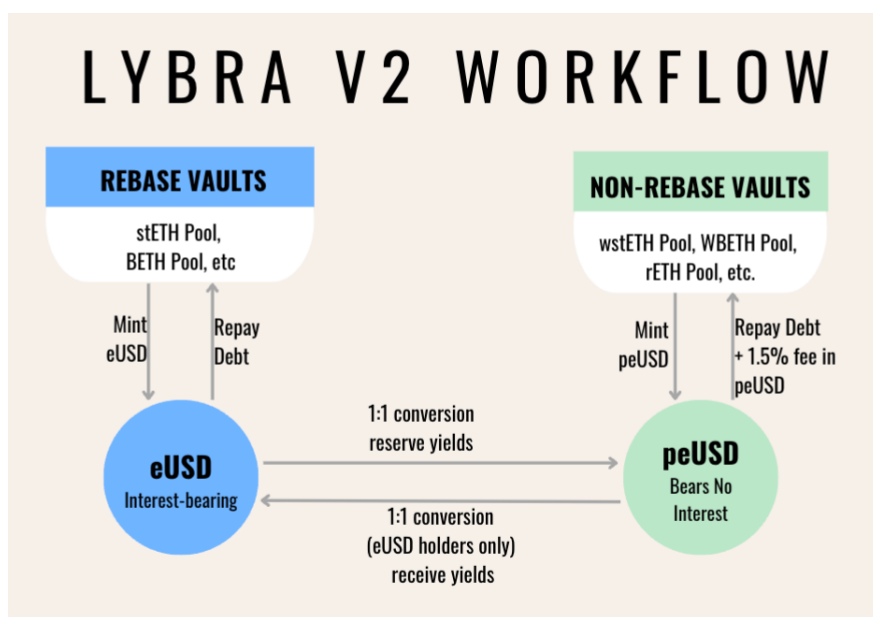


The DeFi landscape continues to evolve, and a new player has entered the scene in the form of LSTs-backed CDP stablecoins. LSTs have gained attention for their potential to unlock liquidity from staked assets, allowing users to participate in the DeFi ecosystem while still earning rewards from their staked holdings, which plays nicely with CDP stablecoins dynamics. The growth of LST-backed stablecoin protocols is presented in the overview below.



TVL fluctuations for some of the LSTs backed CDP Stablecoins (Source: [DeFiLlama](#))

Lybra allows for only ETH and its derivatives deposits. Users mint/borrow eUSD stablecoin against provided collateral. The stability of eUSD is upheld by a blend of over-collateralization, liquidation mechanisms, and arbitrage opportunities. These elements collaboratively ensure the proximity of eUSD's value to its 1 USD peg. The recent V2 upgrade introduced new collateral options. Lybra supports stETH, wstETH, rETH, and WBETH. The update also launches the peUSD. It can be minted directly by non-rebase LSTs or converted from eUSD at a 1:1 ratio through Lybra protocol. With peUSD, the Lybra team addresses one of the LST issues. Particularly rebase tokens. They are hard to integrate into DeFi applications due to the daily rebasing procedure and associated architecture. peUSD unleashes the eUSD utility in decentralized finance. Lybra provides a great explanation of both LST-backed stablecoins differences. With such a design, eUSD and peUSD serve rebasing and reward-bearing liquid staking tokens. Users can decide whether eUSD is their last stop or convert holding into peUSD and explore more DeFi possibilities. Lybra V2 accumulated \$266M in total ETH/LST deposits.



Lybra V2 workflow chart (Source: [Lybra Docs](#))

Raft enables users to generate R, a USD stablecoin, through two primary methods: by opening a Collateralized Debt Position (CDP) or by depositing stablecoins into the Raft protocol reserve. When opting for the CDP route, users can use wstETH, rETH, cbETH, and swETH to mint R for an annual interest rate of just 3.50%. Additionally, the protocol accepts wrapped ETH (WETH) and wrapped BTC (WBTC) as collateral, with a minimal interest rate of 3.00% for minting R, using either of these two assets. Across most collateral options, the minimum collateralization ratio stands at 120%. Raft offers enhanced capital efficiency, instant liquidations, and a Peg Stability Module (PSM) that ensures a robust and steady peg for R. Although the (LST) summer has turned into autumn, Raft's spirit of innovation remains undiminished. Its latest feature, the R Savings Rate, provides a fixed 10% APR to all users who deposit into the R Savings Module.

Gravita Protocol operates in the same space as Lybra and Raft but takes a cosmic theme and narrative. Gravita allows a non-custodial and decentralized way to enhance staked token rewards. Borrowers can supply LSTs, including rETH, wstETH, bLUSD, swETH, sfrxETH, plus WETH. Users have two blockchains to choose from, Ethereum and Arbitrum,

where they receive GRAI stablecoins for deposited assets. They mint GRAI against the value of their collateral, an over-collateralized debt token, mimicking CDP stablecoins architecture. Gravita strives to offer more collateral options than the competition, incentivizing more people to use the platform. Although LSTfi rivalry is relentless, Gravita remains at the forefront, offering fresh strategies to utilize GRAI in DeFi liquidity pools.

Curve Finance, a leading automated market maker (AMM) platform, ventured into the stablecoin sector in May 2023 by introducing crvUSD. The platform offers an extensive array of liquidity pools, each representing cryptocurrency trading pairs. Notably, these pools comprise LSTs, establishing a robust market for crvUSD. Curve's stablecoin ecosystem empowers users to mint crvUSD using a diverse range of crypto-tokenized collateral options. This innovative system enhances both flexibility and accessibility. crvUSD falls into the overcollateralized CDP stablecoin category, with various cryptocurrencies as collateral. The addition of new collateral options will be subject to community proposals, as Curve operates as a DAO. The community will collectively decide on the inclusion of additional assets. Initially, the LST collateral options are two ETH-based liquid tokens, sfrxETH and wstETH. Despite crvUSD being in its early stages and undergoing testing, with a relatively small cap of collateral assets, there is significant demand for this stablecoin. crvUSD demand can be attributed to Curve's prominent position within the DeFi ecosystem and its status as the second most prominent decentralized exchange in terms of TVL, as reported by DeFiLlama.

Prisma Finance fills up any voids left in the Curve ecosystem. Prisma is backed by Curve Finance, Convex, Frax, LlamaNodes, and Coingecko founders among others. The protocol provides a CDP stablecoin called mkUSD, for which LSTs serve as the collateral. Prisma accumulated \$81M in ETH and LSTs deposits during its guarded launch backing \$40M mkUSD. At launch, users could open a vault and mint mkUSD from wstETH, rETH, cbETH, and sfrxETH. Alternatively, they could zap ETH directly into the LST of their choice. Once minted, mkUSD can be employed in the protocol Stability pool, or in Curve and Convex liquidity pools to earn additional yield.

Similar to other protocols, the stability of mkUSD is upheld by a blend of over-collateralization, liquidation mechanisms, and arbitrage opportunities. The protocol can set different parameters per LST, allowing it to adapt to LSTs of different characteristics. The PrismaDAO ensures that the protocol will be a non-custodial and decentralized system. To make so, token holders will vote on new collateral options in a structured process or vote in new emission receivers like new liquidity pools. Weekly voting is enhanced by some practical improvements such as lock weight freezing and vote locking, so that participants have no need to relock or vote every week.

Ethena is last on our LST-backed stablecoins list, but for sure is not the least. It fundamentally differs from the above-mentioned projects. Ethena has not launched yet. It is a decentralized stablecoin issuer offering USDe. Ethena addresses the problem of the crypto ecosystem's reliance on traditional finance and wants to create a stable asset not dependent on legacy banking infrastructure. USDe is poised to introduce a crypto-native, censorship-resistant, scalable, and stable financial solution by delta-hedging staked ETH. USDe will operate transparently, offering seamless composability across the DeFi landscape.

USDe is forged through a blend of delta-neutral derivative tactics applied to liquid-staked Ethereum collateral, accessible across centralized and decentralized platforms.

Users can deposit ETH, USD, and liquid staking tokens to mint USDe. This approach has several advantages. Firstly, it ensures scalability by employing derivatives that prevent the need for substantial over-collateralization, enabling a 1:1 collateralization ratio. Secondly, stability is preserved by executing unleveraged short perpetual positions against the collateral at the point of issuance, guaranteeing that USDe is only minted when the initial notional balance is perfectly hedged. Additionally, the protocol achieves censorship resistance by securely segregating collateral from traditional banking systems and storing trustless crypto collateral in on-chain, transparent, and auditable custody accounts.

While primarily designed as a crypto-native stablecoin, USDe's infrastructure lays a robust foundation for developing a range of innovative financial products, including a stable transactional dollar to replace fiat stablecoins (currently #1 type), the issuance of floating and fixed rate bonds, the establishment of a crypto-native yield curve and a risk-free rate, and participation in repo-financing, thereby expanding opportunities within the crypto ecosystem. Ethena's plans are ambitious and try to challenge the traditional finance market flow.

Liquity, the LUSD issuer, deserves mention in this section. The largest permissionless protocol utilizing only ETH as collateral to mint a CDP stablecoin has revealed its plans for expanding collateral type to LSTs for their v2. Though still in its early stages, the new version is set to introduce several innovative features. Firstly, a new, more scalable stablecoin. Secondly, perpetual leverage product that offers downside protection without ongoing fees. Such a solution allows those seeking leverage to maximize returns on their staked ETH while getting additional protection on the downside. Lastly, a borrowing mechanism enables users to borrow against their staked ETH without interest, which enhances the loan-to-value ratio. Importantly, the team also wants to stick with its decentralized principles and is looking to make the protocol as immutable as can be.

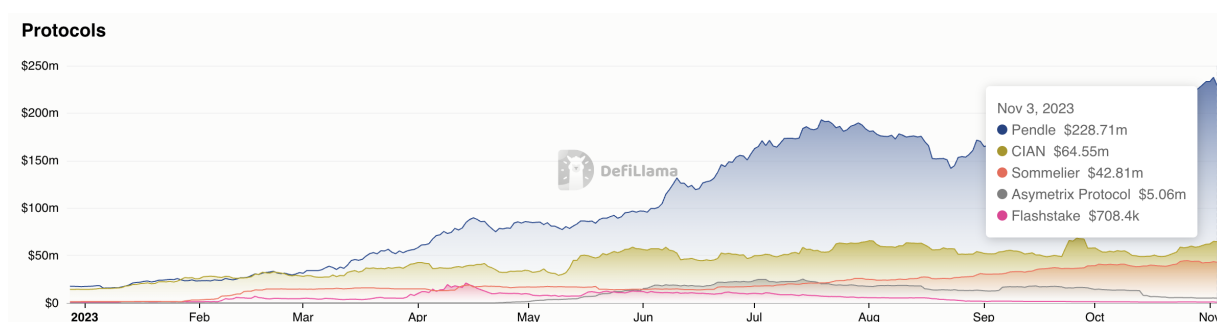
The LST-backed stablecoin landscape is doing well, being one of a few sectors recording growth regarding TVL and users. Are LST-backed stablecoins the future? Probably not. It might be hard for them to obtain the prevailing position. However, they will work as an important cog in maximizing capital efficiency. As it goes in everything in DeFi, leveraging derivative tokens and other platforms increases the risk. Each participant needs to determine their risk levels.



Delve deeper into the topic of stable assets by reading [the Stablecoins Report](#).

Earning Platforms

In 2023, LSTfi evolved into a full-blown industry. The supply of liquid staking tokens led to the creation of earning platforms. All of them offer extra yield opportunities. Protocols design unique, new, and appealing mechanisms to incentivize users. Although, in principle, they all operate similarly, providing tempting APYs and APRs, they implement various techniques to achieve it.



TVL fluctuations for some of the LSTs Earning Platforms (Source: [DeFiLlama](#))

Pendle is an asset management protocol that empowers users with greater control over their yield. The project takes an innovative approach that allows users to tokenize future interest from reward-bearing assets. The team created a token standard (EIP-5115) called SY – Standardized Yield, which wraps interest-generating tokens and provides a unified architecture adapting them for further use. To accomplish this, users must deposit their tokens into a smart contract on the Pendle platform. Available LSTs include stETH, sfrxETH, swETH, OETH, ETHx, and additional stablecoin derivatives such as eUSD, sDAI, and fUSDC. This action results in the minting of both future yield tokens (YT) and principal tokens (PT). While PT represents the underlying staked asset, YT encapsulates the future rewards of the staked assets. Users can experiment with sophisticated strategies, including longing, shorting, and speculating on interest fluctuations in the trade module, and track their results on the leaderboard dashboard. But what truly sets Pendle apart is its focus on yield tokenization, AMM, and vote-escrowed tokenomics.

Pendle Earn offers yield solutions for less experienced users with fixed APY. Pendle Earn and Trade operates on a shared set of contracts, each offering a distinct user interface tailored to serve diverse user groups. They can deposit LSTs and select the maturity of staking. Alternatively, they can provide liquidity to earn fees and rewards. A fixed yield position on Pendle Earn corresponds to a principal token position on Pendle Trade. Both modules make Pendle one of the largest LSTfi protocols, accumulating \$230M in TVL.

In the world of Pendle, strategies abound, promising to reshape the DeFi landscape further. But the central takeaway is clear: the decomposition of yield-bearing assets, ushering in a new era of innovation. As the DeFi ecosystem continues its rapid evolution, Pendle stands as a beacon of progress, offering advanced solutions for yield management. Its role as a harbinger of change is already evident, and its future promises to be nothing short of transformative. To boost the Pendle LST utilization, **Equilibria** and **Penpie** (the latter built by **Magpie**) allow bribe markets for the LST pools on Pendle and help users enhance LP rewards on LST pools.

Sommelier is a yield-aggregating platform that provides automated vaults. Sommelier

introduces intelligent pools designed to adapt and thrive in changing DeFi landscapes. These vaults can predict future base yields, react to market shifts, optimize capital efficiency, and evolve to seize new yield opportunities. By offering mid-frequency strategy execution on a secure validator set, Sommelier distinguishes itself in the realm of asset management platforms. The protocol leverages Cosmos SDK, providing multichain access without bridged assets and offering efficient transaction processing with Tendermint Consensus. It combines off-chain computation for privacy and a decentralized governance mechanism for user fund security, ensuring a non-custodial, user-governed, and censorship-resistant protocol.

Sommelier offers vaults utilizing LSTs. Users can boost their rewards for stETH and swETH in respective Turbo vaults. Lido's stETH offers potential for dynamic strategies within Sommelier. This vault's primary focus is to optimize ETH yields by dynamically managing liquidity through leverage staking, concentrated DEX liquidity provisioning, and LST-ETH peg arbitrage. The initial phase of the Turbo swETH strategy focuses on optimizing Uniswap v3 swETH-ETH pairs, aiming to capture sustainable yield. It may employ a "peg defense" strategy to enhance returns by maintaining a narrow liquidity range near parity. The vault can also allocate to swETH pools on Balancer for favorable yields, making the most of emerging opportunities as swETH's presence grows in the liquid staking DeFi ecosystem. In addition, Sommelier provides a Real Yield ETH vault that maximizes yield through Aave and Compound leveraged staking and Uniswap V3 liquidity provisioning LSTs. The vault utilizes stETH, rETH, and cbETH.

CIAN is a decentralized platform that focuses on safe and efficient DeFi yield opportunities, particularly associated with liquid staking tokens. Users can employ CIAN to create, manage, and optimize multi-protocol strategies involving cryptocurrencies, including BTC, ETH, stablecoins, and popular LSTs like stETH, MaticX, and sAVAX. Liquid staking is at the core of CIAN's operations, enabling users to increase rewards and protect against negative scenarios like liquidation and impermanent loss. The protocol's strategies and tools are designed to help maximize returns while minimizing risks, all within a secure and transparent platform.

CIAN provides two vaults performing LST-based strategies on four networks: Ethereum, Avalanche, Optimism, and Arbitrum. The largest vault regarding the TVL allows ETH/WETH/stETH/wstETH as collateral. This strategy targets ETH and (w)stETH holders to boost liquid staking yields by recursively supplying (w)stETH and borrowing wETH on top lending platforms like AAVE V2, AAVE V3, Compound, and Morpho for optimized APY. Changing the network to Layer 2s removes the possibility of depositing stETH, but the entire process remains untouched. The last vault provides the opportunity to supply rETH, but it is not CIAN's most utilized strategy. Completing the whole protocol overview, CIAN offers automation tools to execute recursive staking plans. They can be created on Ethereum, Polygon, or Avalanche, and users can deposit stETH, MaticX, stMATIC, and sAVAX, respectively.

Asymetrix Protocol has a different approach to generating yield. They combine staking with the lottery. Such design spices things up and encourages users interested in technology exploration rather than stable earning rewards. The team describes the protocol as a psychological gadget that cultivates saving behavior. Asymetrix utilizes just stETH. People deposit stETH into the platform and enter the weekly lottery automatically. As long as participants keep assets in the protocol, they are granted the draw access. Asymetrix collects all the deposited stETH and creates a pool managed by

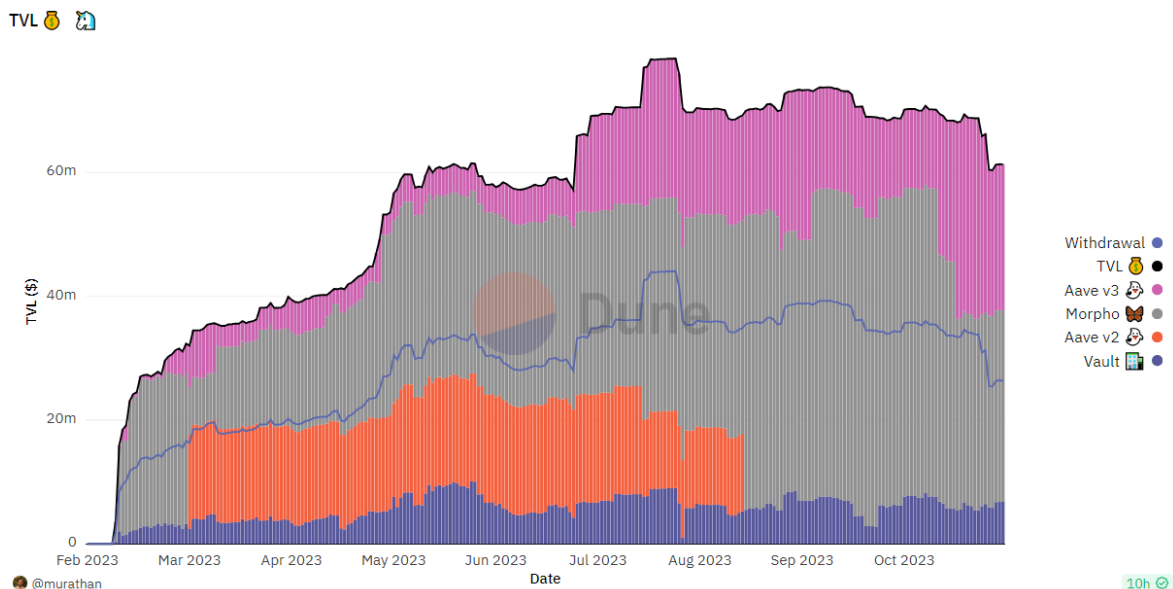
a smart contract. The pool earns rewards, and the winner is selected at the end of the draw period. The model is based on the UK Premium Bonds.

Although Asymetrix Protocols does not offer guaranteed staking rewards, it does not have a yield ceiling. Users can earn triple-digit rewards depending on the total stETH staked and individual deposits. It definitely brings excitement into the staking process. All participants earn additional ASX tokens. The distribution is based on the percentage of all stETH that each user holds in the protocol. Asymetrix might not be for everyone. However, it offers a fun experience in the LSTfi ecosystem. Protocol participants should treat it more like Powerball, although the odds are more favorable. Currently, Asymetrix has over 2800 stETH locked, but such inventions thrive better in bull market conditions. Nevertheless, Asymetrix Protocol provides an entertaining alternative to LST staking.

Flashstake is a great example of the diversification of LSTfi protocols. They focus on upfront yield for crypto assets, including liquid staking tokens stETH and rETH. Users can lock up cryptocurrencies and earn interest in advance. They instantly receive predicted future yield, allowing them to utilize it, i.e., in other LSTfi protocols. User funds are safeguarded from liquidation, remaining consistently 100% collateralized. They can lock their funds for any duration, down to the precise minute, granting them full knowledge of when their principal will become accessible. Furthermore, Flashstake users retain the option to unlock their principal at their discretion, facilitated by the repayment of a portion of their upfront yield. Barring any unforeseen exploits, the technical infrastructure ensures the impossibility of users losing their deposited assets.

The LSTfi landscape is loaded with various earning platforms. Some specialize in liquid staking only. Others provide a more holistic approach. This category includes Instadapp and Morpho. They both offer earning solutions for LSTs besides standard cryptocurrencies. These protocols utilize other DeFi platforms to generate yield. Their supported LST of choice is stETH. Instadapp and Morpho introduce earning strategies that rely on top crypto lending services. Using multiple protocols can help maximize rewards, additionally spreading the risks associated with single platform staking.

Instadapp offers a strategy for stETH that encompasses Aave, Lido, Compound, and even Morpho utilization itself. This tactic involves the conversion of ETH into stETH, which is then leveraged against standard ETH to amplify the rewards obtained through ETH staking. The TVL of ETH/stETH vaults on Instadapp reaches \$64M. The chart below presents the strategy spread among lending protocols. Although Instadapp is a multi-purpose platform, it overtakes most LST protocols. In addition, when users deposit assets into the Lite dApp, they receive iTokens. They are derivatives that represent staked funds and earned rewards. iTokens are liquid and can be traded or bridged to different chains.



Instadapp Lite v2 IETH vault breakdown (Source: [Dune](#))

Morpho acts as a finance layer on top of DeFi lending protocols. It introduces optimizers and gateways providing higher yield and lower borrowing rates. Morpho utilizes Compound and Aave and inherits their liquidity and risk parameters. stETH staking uses Aave V2 and V3 version. The supply of stETH/wstETH in both optimizer pools equals an incredible \$564M, contributing significantly to the LSTfi economy. Morpho's technology and products are highly appreciated among individual investors and other DeFi projects. The graphic above is a good example of this. About 50% of Instadapp Lite Vault's TVL is distributed to Morpho optimizers.

Tokemak, a platform with a relatively long history, aims to revolutionize yield optimization for LSTs with their V2 launch. The new version is still a work in progress. Tokemak's proposed upgrade is built around a novel concept called Liquidity Management Pools (LMPs). The new architecture includes two modules: Autopilot, which dynamically allocates and optimizes rewards across different pools, and DAO Liquidity Marketplace, focused on providing a liquidity order book that enables decentralized organizations to rent liquidity. Initially, Tokemak V2 will address the LST market. Autopilot enhances LP returns by dynamically allocating liquidity while simplifying user interaction and reducing gas costs. This system carefully considers various factors, including yields, exchange rates, slippage, and liquidity constraints.

Tapio attempts to disrupt the LST space by allowing users to provide LST/ETH liquidity and remaining liquid (in testnet currently). Users can mint tapETH, which serves as an LP token, by depositing native ETH or LSTs, earning the underlying staking yield, but also swap fees, redemption fees and unwrap fees, among other fees that are generated by Tapio's stable pools. At Tapio, providing liquidity is a "step" in the liquid staking journey, rather than a conclusion. Users can either hold tapETH, a rebasing token, or wrap it for wtapETH and use it within DeFi. The mainnet launch date is unknown, but Maverick and Gravita already test out the integration.

Last but not least, **Synthetix** Perps supports stETH/ETH and stETH/USD markets. Interestingly, Synthetix Perps is the only perpetual exchange protocol that supports LST markets. But the expansion plans do not stop there since the SNX governance has

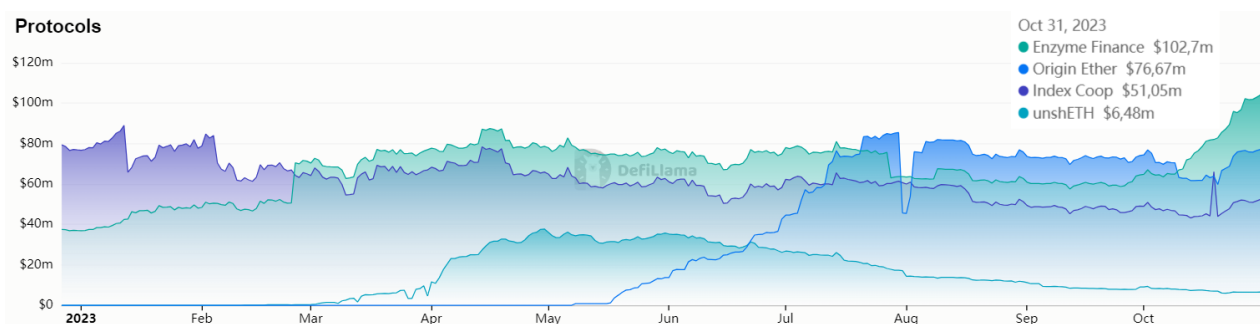
started a discussion to support wstETH markets. Even though these markets are not a significant part of the platform's volume yet, the team expects LSTs to be one of the growth motors for the current version and widely anticipated full V3 Perps launch.

LST Indexes

Indexes offer investors a convenient solution to access a diverse range of liquid staking tokens through a single asset. Like traditional ETFs or index funds, these products within the LSTfi ecosystem comprise a curated selection of LSTs, each assigned specific weightings and strategies.

Investing in LST indexes brings several advantages and unlocks additional opportunities. Firstly, it enables diversification within the liquid staking market, effectively mitigating risk by spreading exposure across multiple assets. Additionally, participation in an LST index contributes to the network's decentralization, as investors engage with a basket of LSTs rather than a single entity. Lastly, the simplicity and convenience of indexes automate the distribution of investments across multiple liquid staking tokens, eliminating the need for individual selection and management. However, what's intriguing for the crypto market, in general, is that indexes have not really caught on. Maybe the combination of the largest DeFi category and indexes will result in a popularity increase.

While indexes present diversification benefits, it is essential to recognize that each underlying asset carries its unique risk profile. Thorough due diligence and research remain crucial when evaluating investment options. Furthermore, as with all structured products in the LSTfi space, investors should exercise caution and consider smart contract risk as a part of their investment strategy. Please, bear in mind that the mentioned projects do not focus solely on liquid staking tokens. Indexes based on LSTs make up an even smaller percentage. Their success heavily depends on the overall crypto index adoption.







TVL fluctuations for some of the LSTs Index Protocols (Source: [DeFiLlama](#))

Index Coop is the "og" (original gangster) project regarding crypto indexes. The protocol launched in 2020, offering easy access to crypto ETFs represented as ERC20 tokens. The offered products vary and include the Diversified Staked Ethereum Index (dsETH) and Interest Compounding ETH Index (icETH).

dsETH provides diversified exposure to prominent liquid staking tokens in the Ethereum ecosystem, emphasizing decentralization. It employs a methodology considering security, transparency, liquidity, and client diversity for inclusion. dsETH includes rETH,

wrapped stETH, and sETH2, plus sfrxETH after the first rebalancing. Users can mint or redeem dsETH by supplying components proportionally.

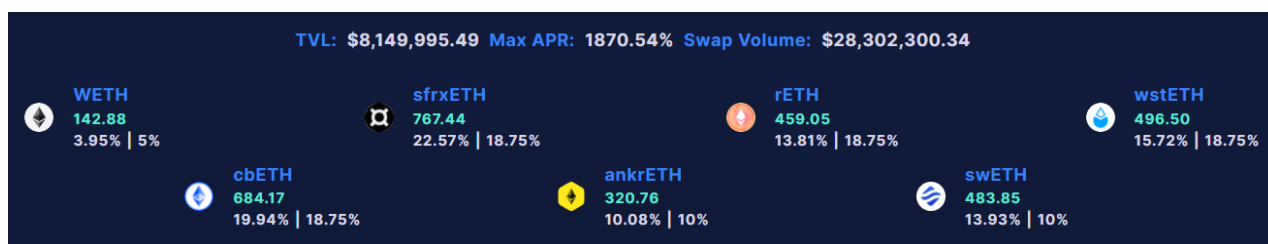
The icETH index offers enhanced exposure to ETH staking rewards through leverage, utilizing Set Protocol and Aave. icETH strategy executes deposits stETH on Aave as collateral and borrows ETH. Then, borrowed ETH is swapped for additional stETH. It creates a depositing-borrowing cycle to maintain a target leverage ratio of 3.1x, with automated mechanisms for rebalancing and extra safeguards in place.

TOKEN	ALLOCATION
 Rocket Pool ETH	37.3%
 Wrapped stETH	24.0%
 sETH2	22.0%
 Staked Frax Ether	16.7%

Diversified Staked Ethereum Index (dsETH) breakdown (Source: [Index Coop](#))

Both dsETH and icETH have their advantages and disadvantages. dsETH provides straightforward exposure to liquid staking rewards, offering diversification and cost savings. In contrast, icETH offers higher yields but carries leverage-related risks like liquidation and interest rate fluctuations. To sum up, dsETH is ideal for those seeking simple, diversified exposure to staked ETH, while icETH will suit users focused on maximizing yield.

unshETH is another interesting project in the LSTfi realm. Its primary objective is to promote decentralization among liquid staking protocols and tackle the validators' concentration. The unshETH token is at the center of it. It comprises a basket of the most popular LSTs, including wstETH, rETH, sfrxETH, cbETH, ankrETH, and swETH. unshETH offers one of the greatest diversities in the space, integrating six different liquid staking tokens. It truly acts as an LST indicator. The protocol distributes funds across various LSTs, which can be monitored on their website. Allocation between tokens is fairly equal, mitigating protocol concentration risks.



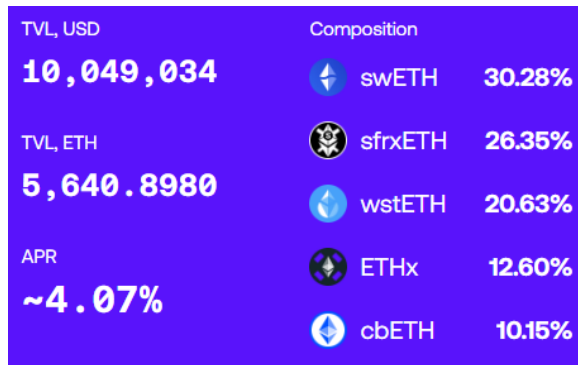
unshETH index breakdown (Source: [unshETH](#))

unshETH stakes funds with multiple LST providers. It earns yield from many sources, offering users averaged rewards. unshETH holders are not exposed to single protocol dangers thanks to the diversification. The value of 1 unshETH corresponds to 1 ETH worth of any LST and equals the basket of liquid staking tokens in a proportional ratio. unshETH has configurable target weights, maximum weights, and risk caps for each supported LST token. In addition, the possibility of swapping between different LSTs is a great feature. Users can easily exchange one liquid staking token for another. It is a helpful feature that saves time and money compared to performing all the steps yourself.

Enzyme is an on-chain asset management system that enables users to access 220+ digital assets and dozens of DeFi protocols from one unified app. The protocol provides a front-to-back execution and order management system, which empowers managers to run a variety of on-chain asset management strategies and lower asset management expenses. The Enzyme asset universe offers swETH from Swell currently. Additionally, Enzyme has proposed to boost the osETH LP program from StakeWise and plans to provide support for additional Liquid Staking Tokens. Enzyme's most successful partnership to date is its support for Diva Staking. The pre-launch TVL vaults of Diva DAO run on Enzyme's asset management infrastructure and allow early stakers to deposit stETH or ETH to earn DIVA tokens. The vault has attracted more than \$30M in stETH in the first month alone, which will eventually be converted to divETH.

Yearn Finance, the largest DeFi yield-aggregating platform by TVL, has its own LST index token as well. In short, Yearn offers a platform for depositing digital assets to earn yield. The protocol is governed by YFI token holders and maintained by various independent developers. It features Yearn Vaults, which are pools designed to automatically generate interest by capitalizing on market opportunities. Vaults provide users with advantages such as shared gas costs, automated yield generation and rebalancing, and capital optimization without requiring in-depth knowledge of underlying protocols or DeFi, making it a passive investment strategy.

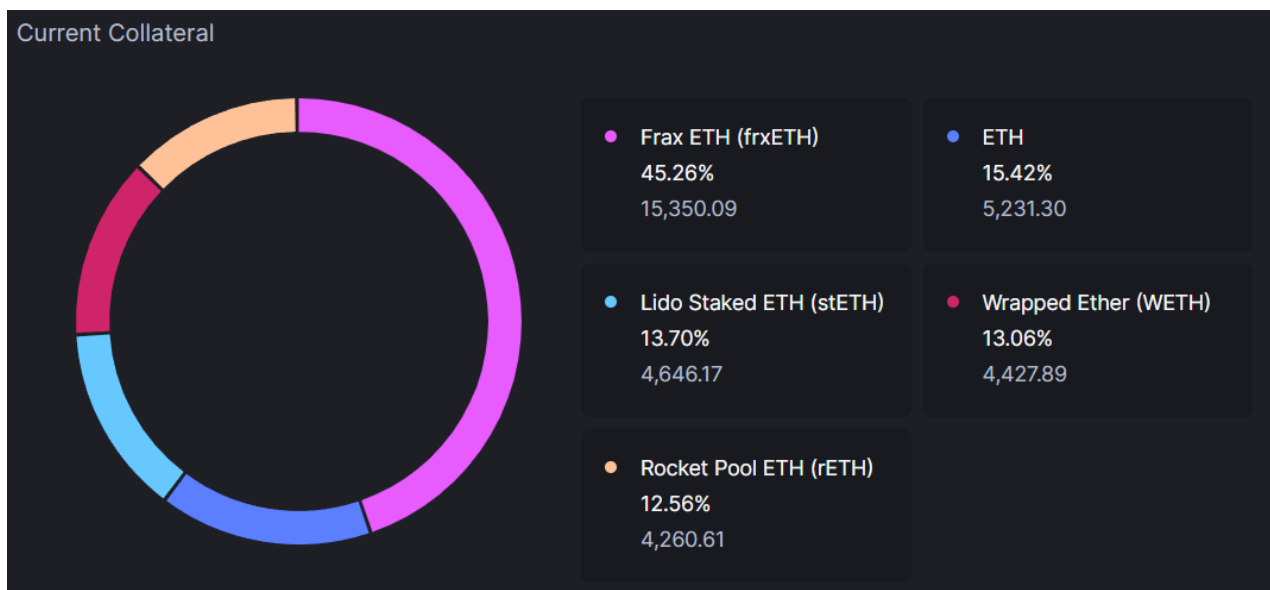
Yearn offers a LST index called yETH. Today, it comprises five liquid staking tokens, including swETH, sfrxETH, wstETH, ETHx, and cbETH. The percentage composition is presented on the screen below. Up to 1 new LST per epoch can be voted into yETH. The protocol is fully controlled by yETH stakers. The yETH protocol is an Automated Market Maker (AMM) for LSTs. What is convenient about yETH is that users can deposit any of the 5 LSTs (in any combination) to receive the index token. It is a single-sided mechanism providing flexibility for users. Another way to obtain yETH is swapping ETH on decentralized exchanges like Curve. Users can further stake their yETH to mint st-yETH and earn interest and participate in governance. Stakers receive all Ethereum Beacon Chain rewards and slashings, additional incentives for participating in yETH governance, and fees from swaps within the yETH AMM. The st-yETH protocol bundles LSTs to optimize risk-adjusted yields from ETH staking.



yETH backing assets basket breakdown (Source: [yETH](#))

Origin DeFi offers Origin USD (OUSD) and Origin Ether (OETH). The latter refers to LSTfi. OETH is a yield aggregation alternative for liquid staking tokens. It builds on the codebase of Origin Dollar. OETH leverages liquid staking yield, boosting APYs through DeFi strategies. Ethereum staking participation skyrocketed since the withdrawal implementation and Shapella upgrade. However, the liquid staking sector is dominated by a few players, raising concerns about centralization. To mitigate risks and optimize yields, OETH provides an elegant solution, offering exposure to various LSTs and diversified staking strategies, including AMO strategies on Curve and Convex, enhancing yield potential for OETH holders.

Origin Ether utilizes well-known liquid staking tokens covering stETH, rETH, frxETH, and sfrxETH. At all times, OETH is redeemable for a basket of the mentioned LSTs and ETH. To provide industry-leading APYs, Origin uses advanced DeFi strategies through supported protocols. The capital goes into many battle-tested protocols, including Curve, Convex, Lido, Rocket Pool, Balancer, and Aura. Origin outperforms rival protocols in generating superior yields thanks to a strategic combination of crucial design choices that magnify the rewards accruing to OETH holders.



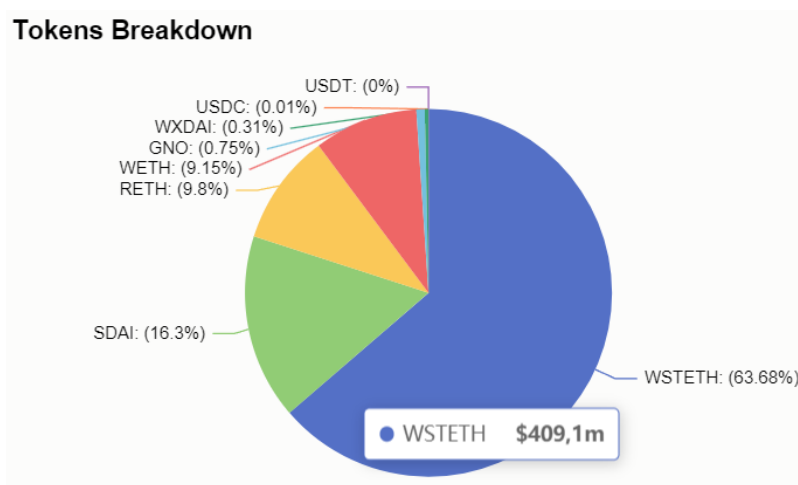
OETH backing assets basket breakdown (Source: [OETH](#))

Origin products are fully transparent. Their platform helps track yield sources and allocation distribution. The analytics dashboard lets users monitor current and historical APY values, total OETH supply, protocol revenue, collateral distribution, and OETH peg. All this data increases users' awareness and helps them understand system mechanics. Furthermore, users can verify where all assets work and how many are utilized. Protocol calculates each strategy token allocation and presents percentage fractions presenting exposure. In addition, Origin introduces Drippier, a system that releases the yield steadily over time. It streams the interest gradually for a smoother and more predictable APY.

LST Lending

Lending is an indispensable part of decentralized finance. The core principle of this DeFi pillar is the flow, where users deposit collateral in various assets and borrow the same or other assets against it. There are different types of lending, i.e., non-isolated and isolated. Importantly, the industry's most recognizable lending protocols, [Aave](#) and [Compound](#), which have billions of dollars locked in, are not indifferent towards LSTs. Whereas both incorporate wstETH, cbETH, and MaticX (Stader), Compound also facilitates stETH and stMatic (Lido). On the other hand, Aave embraces rETH and sAvax (BenQi). Moreover, the other two lending giants also allow LSTs in their flow. [Venus](#), the outstanding leader on the BNB Chain, supports BETH and WBETH, plus several BNB-based LSTs like ankrBNB or BNBx (Stader). [Radiant](#), the largest lending protocol on Arbitrum by TVL, takes more cautious steps with LST, incorporating only wstETH for now. What is more, a growing LST execution is visible in projects such as Spark Protocol, Silo Finance, and Alchemix.

[Spark Protocol](#) is a decentralized, non-custodial liquidity protocol. Users can decide to become a supplier, borrower, or liquidator. Suppliers contribute liquidity to the market, earning interest on the provided crypto assets. Borrowers can access loans with overcollateralization and even execute undercollateralized one-block borrow transactions, known as flash loans. Lending markets include stablecoins, ETH, GNO, and liquid staking tokens rETH and wstETH. Users supply LSTs and increase their borrowing capacity. Although Spark Protocol launched recently, it grew its TVL fast, approaching \$650M. The token breakdown also indicates why LSTfi is becoming so popular. The majority of supplied assets include liquid staking tokens.



Breakdown of Spark's TVL by assets (Source: [DeFiLlama](#))

Silo Finance is pioneering decentralized lending markets with its permissionless and risk-isolated approach. Users can lend and borrow assets without the need for centralized intermediaries. The unique aspect of Silo's approach is the isolation of risk within each lending pool. Unlike traditional lending protocols like Aave and Compound, which use shared-pool lending, Silo establishes separate markets for individual tokens – silos, each paired with bridge assets like ETH and Silo's stablecoin XAI. Lenders are exposed only to the risk associated with these bridge assets, making the system more secure and preventing potential exploits in one market from affecting others. This approach ensures efficiency, prevents fragmented liquidity, and opens the door for a broader range of token assets to be used as collateral, setting Silo apart as an innovative lending protocol in the DeFi space. Silo provides a diversified range of isolated markets, from stablecoins and altcoins to LP tokens and derivatives. Users can supply different LSTs, including cbETH, rETH, and wstETH. Each silo comes with loan details. Borrowers can verify pool utilization, liquidation thresholds, the amount available to borrow, and rewards.

Alchemix is a self-repaying, interest-free, non-liquidating loan protocol. Users can deposit ETH or LSTs like stETH, rETH, or frxETH, and take loans in aETH, a synthetic asset, which represents future yield and may be sold on the market, thus unlocking the value of the loan. Now, here is the trick. Since the debt is denominated all in ETH, liquidations will not and cannot occur, regardless of the price of ETH (as the ratio stays the same). Meanwhile, the ETH value of the initial deposit will remain constant, and the yield earned by the full deposit will pay off the user's debt over time. For example, a user could deposit 100 ETH, select stETH as the yield strategy, and take a loan for 50 aETH. They may sell the 50 aETH for 49 ETH. Now, the user has a 100 ETH earning yield, paying off the 50 aETH of debt over time based on stETH yield. They also have 49 ETH to spend or loop the process. In that way, Alchemix represents a way for DeFi users to access the value of their LSTs without selling them or needing to monitor the health of liquidatable loan positions, which is unique on the market.

5 CoinDesk Indices & CESR™

Ethereum's conversion to Proof of Stake not only created the foundation for the liquid staking ecosystem as described in this report, it also delivered a native crypto rate to finance that can serve as a critical piece of market structure. The staking rate that Ethereum validators generate through participation in the consensus and execution layers and by exhibiting implementation skill has immediate applicability in DeFi, centralized digital asset finance, and traditional finance. This fueled the inspiration to create [CESR™](#), the composite ether staking rate, which is administered by [CoinFund](#) and calculated and published by [CoinDesk Indices](#). Three broad use cases for CESR are currently being adopted by market participants: benchmarking, research, and risk transfer.

Benchmarking

Mass adoption and integration of digital assets in investment portfolios is a critically important global objective for the industry. While many investors will make their first allocation in Bitcoin, the investment case for Ethereum is likely to attract interest as a next step. Not only does ETH have scale, a long-running history, and a growth story, it now has an integrated rate.

As staking becomes better understood—it is an arguably simpler framework to comprehend financially than proof-of-work economics—investors will demand the “yield” that is available with their ether to enhance the attractiveness of the investment. Moreover, they will pit providers—LSTs, funds, ETPs, CEXes, futures contracts—against each other to hunt for the best return. That contest may be won by the provider with the best staking stack (efficiency, uptime and MEV optimization) and/or those who are willing to accept a smaller share of the yield.

Benchmarking of these returns provides the right yardstick for investors to use as a guide, and for providers to demonstrate the implementation alpha they are able to generate and deliver. Of course, this is how things work in traditional finance and what investors and the industry expects. Proper benchmarks will help build confidence.

Research

How should we think about ETH's staking rate? It is a floating rate comprising two parts: rewards for consensus layer duties and priority transaction fees paid to validators from the execution layer. The former is determined by Ethereum's simple “monetary policy” which adjusts rewards based on the aggregate amount of ETH that is staked—a single-objective, security-based policy. The latter is determined by acute demand for the Ethereum network, which tends to rise when new information or opportunities enter the system, good or bad.

How does this compare to rates in traditional finance? Consensus rewards are paid to help secure (but not finance) the network. They are determined by a stated policy, like a central bank rate, but not subject to political influence or economic interpretation risk (at least in the short term). They are crystal clear and reasonably predictable. Priority

transaction fees (those paid to validators after base fees are burned) are less predictable and subject to spikes when network demand rises. Almost like an inverted credit spread, this demand spread widens when demand for Ethereum causes users to pay extra gas to get transactions on the blockchain faster, even overwhelming Ethereum's variable block size and base fee adjustments designed to dynamically adjust supply to demand.

Should we (and if so, how) compare this rate to US Treasuries or SOFR? They are clearly not direct substitutes, given the different profiles of their funding bases. However, there are clear observable opportunity cost dynamics in the market such as the shrinking of the validator queue as the rate has declined relative to available fiat rates. Should demand for the rate be adjusted by ether's forward-looking inflation/deflation status? Should it be implied in ether futures contracts or the OTC forward market? Plenty to discover. At a minimum, the calculation of a standardized and independently-calculated rate, along with access to its components, can provide analysts with information to help understand Ethereum better, both internally and in comparison to other money markets.

Risk transfer

Ethereum validators stake 32ETH, and get a variable stream of rewards. These are hard to predict—particularly the priority transaction fee component. This yield volatility is not optimal when evaluating a validator's financial performance with measures like its Sharpe ratio. What if the validator could swap its future staking yield for a fixed rate, and what rate would it accept to enter that transaction? This is the genesis of a fixed vs floating swap market, and the birth of a forward curve for the ETH staking rate. Speculators may also want to gain exposure to the future rate, expressing views on network demand, volatility, or macro events. OTC dealers and DeFi protocols can create such marketplaces, whose contracts must settle into an independently calculated, well understood value.

This embryonic but scalable market is an important addition to the idea set for crypto derivatives markets because it goes beyond serving investors and lenders and addresses a new use case: corporate finance. Extracting the staking rate from an ether funding base and trading future values can support a wide range of new products and serve new segments of market participants.

CESR and ETXTR

CESR and the ETXTR (a total return version of the CoinDesk Ether Price Index, incorporating CESR) were designed with these three broad use cases in mind, with structure, methodology documentation, and governance built to deliver institutional-grade benchmarks, robust research data, and a plug-and-play settlement rate for derivatives. Expanding the users and use cases for Ethereum's staking rate will help improve network security, invite new investment interest in ether, and create new bridges from digital assets to traditional finance.

6 Where Should I Stake Ether?

Unfortunately, there is no single answer. There are so many ETH staking solutions that it depends on individual needs and risk exposure. However, starting from the top, is it better to stake ETH on your own (running a node and validating transactions) or to utilize LST solutions? For most end users, using a liquid staking intermediary proves to be more beneficial than solo staking. Why? Because specialized IT knowledge and the minimum stake required are not necessary. Yield generation through staking and liquid staking providers or LSTfi protocols is much easier. It is more user-friendly, and collateral limits are negligibly small. Hence, the next question appears. Which solution to use? Here comes the hard part. Ultimately, it's a decision everyone must make for themselves. This report provides an overview of the most established, popular, and secure protocols available. The table below can help decide the platform of choice. Nevertheless, a few universal principles persist to assist financial decisions. As much as time and knowledge allow, conducting basic research and reading documentation can help understand protocols operations and earning mechanisms. Investors should also verify projects' accountability and credibility as extensively as possible. Summing up, The table compares key factors to consider while choosing which LST protocol to use.

Where should I stake my ether?				
	Issuer	Rewards	Relative Risk	Leverage
LST Protocols	Decentralized protocols and centralized entities	Low	From low to medium, depending on the issuer	From low to medium, depending on the issuer
LST-backed Stablecoins	Decentralized issuers	Medium	Medium	Medium
Earning Platforms	Decentralized protocols	High	High	High

Staking Data, Rating and Advocacy Organizations

[Staking Rewards](#) is the central information hub and #1 data aggregator for the growing \$100B+ staking industry. The company provides insights and investment tools for private and institutional investors through unbiased and live staking market data. Their team created versatile tools such as The Staking Explorer, Staking Portfolio, Staking Rewards Calculator and the [Staking Data API](#). Staking Rewards goes the extra mile, ensuring investors can find reputable staking providers through their [Verified Staking Provider program](#). The program sets the standard for trust and transparency in the staking industry, helping to streamline the due diligence process for investors looking to stake.

Besides providing comprehensive market data, the leader in staking analytics also hosts the first and largest staking event in the world, the [Staking Summit](#). The 2023 edition of the Staking Summit takes place on 10–11 Nov in Istanbul. The event brings together 800+ staking industry leaders to discuss where PoS goes next.

Rank	Provider	AuM	AuM Change	Stakers	SR Rating	Supported Assets	Country	Action
1	Lido Finance	\$15.67b +15.95%	+\$1.83b	273.48k +2.2%	AA Liquid Staking	ETH	Global	Stake Now
2	Allnodes	\$2.22b +22.53%	+\$197.64m	279.77k +4.87%	AAA PoS	ETH, SOL, AVAX, MATIC, DOT, ADA, XRP, BCH, LTC, TRX, ZEC, DASH, XMR, DOGE, SHIB, PEPE, FLOKI, BNB, USDT, USDC, DAI, WBTC, LINK, UNI, COMP, SUSHI, SNX, MKR, AAVE, CRV, YFI, ZRX, BAT, ENJ, MANA, SAND, AXS, GALAX, TWT, BICO, COTI, CVC, CVC2, CVC3, CVC4, CVC5, CVC6, CVC7, CVC8, CVC9, CVC10, CVC11, CVC12, CVC13, CVC14, CVC15, CVC16, CVC17, CVC18, CVC19, CVC20, CVC21, CVC22, CVC23, CVC24, CVC25, CVC26, CVC27, CVC28, CVC29, CVC30, CVC31, CVC32, CVC33, CVC34, CVC35, CVC36, CVC37, CVC38, CVC39, CVC40, CVC41, CVC42, CVC43, CVC44, CVC45, CVC46, CVC47, CVC48, CVC49, CVC50, CVC51, CVC52, CVC53, CVC54, CVC55, CVC56, CVC57, CVC58, CVC59, CVC60, CVC61, CVC62, CVC63, CVC64, CVC65, CVC66, CVC67, CVC68, CVC69, CVC70, CVC71, CVC72, CVC73, CVC74, CVC75, CVC76, CVC77, CVC78, CVC79, CVC80, CVC81, CVC82, CVC83, CVC84, CVC85, CVC86, CVC87, CVC88, CVC89, CVC90, CVC91, CVC92, CVC93, CVC94, CVC95, CVC96, CVC97, CVC98, CVC99, CVC100	USA	Stake Now
3	Kiln	\$2.13b +24.2%	+\$270.53m	34.51k +9.35%	AAA PoS	ETH, SOL, AVAX, MATIC, DOT, ADA, XRP, BCH, LTC, TRX, ZEC, DASH, XMR, DOGE, SHIB, PEPE, FLOKI, BNB, USDT, USDC, DAI, WBTC, LINK, UNI, COMP, SUSHI, SNX, MKR, AAVE, CRV, YFI, ZRX, BAT, ENJ, MANA, SAND, AXS, GALAX, TWT, BICO, COTI, CVC, CVC2, CVC3, CVC4, CVC5, CVC6, CVC7, CVC8, CVC9, CVC10, CVC11, CVC12, CVC13, CVC14, CVC15, CVC16, CVC17, CVC18, CVC19, CVC20, CVC21, CVC22, CVC23, CVC24, CVC25, CVC26, CVC27, CVC28, CVC29, CVC30, CVC31, CVC32, CVC33, CVC34, CVC35, CVC36, CVC37, CVC38, CVC39, CVC40, CVC41, CVC42, CVC43, CVC44, CVC45, CVC46, CVC47, CVC48, CVC49, CVC50, CVC51, CVC52, CVC53, CVC54, CVC55, CVC56, CVC57, CVC58, CVC59, CVC60, CVC61, CVC62, CVC63, CVC64, CVC65, CVC66, CVC67, CVC68, CVC69, CVC70, CVC71, CVC72, CVC73, CVC74, CVC75, CVC76, CVC77, CVC78, CVC79, CVC80, CVC81, CVC82, CVC83, CVC84, CVC85, CVC86, CVC87, CVC88, CVC89, CVC90, CVC91, CVC92, CVC93, CVC94, CVC95, CVC96, CVC97, CVC98, CVC99, CVC100	France	Stake Now
4	P2P.org	\$1.7b +18.12%	+\$199.26m	69.48k +11.82%	AAA PoS	ETH, SOL, AVAX, MATIC, DOT, ADA, XRP, BCH, LTC, TRX, ZEC, DASH, XMR, DOGE, SHIB, PEPE, FLOKI, BNB, USDT, USDC, DAI, WBTC, LINK, UNI, COMP, SUSHI, SNX, MKR, AAVE, CRV, YFI, ZRX, BAT, ENJ, MANA, SAND, AXS, GALAX, TWT, BICO, COTI, CVC, CVC2, CVC3, CVC4, CVC5, CVC6, CVC7, CVC8, CVC9, CVC10, CVC11, CVC12, CVC13, CVC14, CVC15, CVC16, CVC17, CVC18, CVC19, CVC20, CVC21, CVC22, CVC23, CVC24, CVC25, CVC26, CVC27, CVC28, CVC29, CVC30, CVC31, CVC32, CVC33, CVC34, CVC35, CVC36, CVC37, CVC38, CVC39, CVC40, CVC41, CVC42, CVC43, CVC44, CVC45, CVC46, CVC47, CVC48, CVC49, CVC50, CVC51, CVC52, CVC53, CVC54, CVC55, CVC56, CVC57, CVC58, CVC59, CVC60, CVC61, CVC62, CVC63, CVC64, CVC65, CVC66, CVC67, CVC68, CVC69, CVC70, CVC71, CVC72, CVC73, CVC74, CVC75, CVC76, CVC77, CVC78, CVC79, CVC80, CVC81, CVC82, CVC83, CVC84, CVC85, CVC86, CVC87, CVC88, CVC89, CVC90, CVC91, CVC92, CVC93, CVC94, CVC95, CVC96, CVC97, CVC98, CVC99, CVC100	UK	Stake Now
5	InfStones	\$1.48b +16.95%	+\$0	54.85k +1.07%	AAA PoS	ETH, SOL, AVAX, MATIC, DOT, ADA, XRP, BCH, LTC, TRX, ZEC, DASH, XMR, DOGE, SHIB, PEPE, FLOKI, BNB, USDT, USDC, DAI, WBTC, LINK, UNI, COMP, SUSHI, SNX, MKR, AAVE, CRV, YFI, ZRX, BAT, ENJ, MANA, SAND, AXS, GALAX, TWT, BICO, COTI, CVC, CVC2, CVC3, CVC4, CVC5, CVC6, CVC7, CVC8, CVC9, CVC10, CVC11, CVC12, CVC13, CVC14, CVC15, CVC16, CVC17, CVC18, CVC19, CVC20, CVC21, CVC22, CVC23, CVC24, CVC25, CVC26, CVC27, CVC28, CVC29, CVC30, CVC31, CVC32, CVC33, CVC34, CVC35, CVC36, CVC37, CVC38, CVC39, CVC40, CVC41, CVC42, CVC43, CVC44, CVC45, CVC46, CVC47, CVC48, CVC49, CVC50, CVC51, CVC52, CVC53, CVC54, CVC55, CVC56, CVC57, CVC58, CVC59, CVC60, CVC61, CVC62, CVC63, CVC64, CVC65, CVC66, CVC67, CVC68, CVC69, CVC70, CVC71, CVC72, CVC73, CVC74, CVC75, CVC76, CVC77, CVC78, CVC79, CVC80, CVC81, CVC82, CVC83, CVC84, CVC85, CVC86, CVC87, CVC88, CVC89, CVC90, CVC91, CVC92, CVC93, CVC94, CVC95, CVC96, CVC97, CVC98, CVC99, CVC100	USA	Stake Now

Top Verified Staking Providers by Staking Rewards, sorted by Asset under Management

Rated Labs has the mission for greater transparency and rich context in Web3 infrastructure data. The company started offering Ethereum infrastructure datasets, i.e., staking-related and is currently expanding into other blockchains, including Polygon or Cosmos Ecosystem. The Ethereum network explorer, the core product from Rated, helps understand the current and historical health of Ethereum's validator set. Interestingly, users can browse, i.e., [the Slashing tab](#), to explore summary and granular statistics on the penalties (opposite to rewards) related to staking. Additionally, developers and node operators can utilize the data API to build reporting, monitoring, and benchmarking products. Lastly, the company offers an oracle that acts as a gateway to bring curated data into the Ethereum mainnet.

Proof of Stake Alliance (PoSA), on the other hand, supports the growth and protection of proof-of-stake-based technologies. The organization consists of legal experts advocating for clear and forward-thinking public policies that foster innovation in the rapidly growing PoS ecosystem. The three main areas of activity of PoSA circulate around legislation, education of lawmakers, and empowerment of proof-of-stake network participants.

7 Oracles: The Fundament of LSTfi

Blockchain Oracles are services that securely provide verified data to dApps built on various networks. Therefore, the three core areas for an Oracle are:

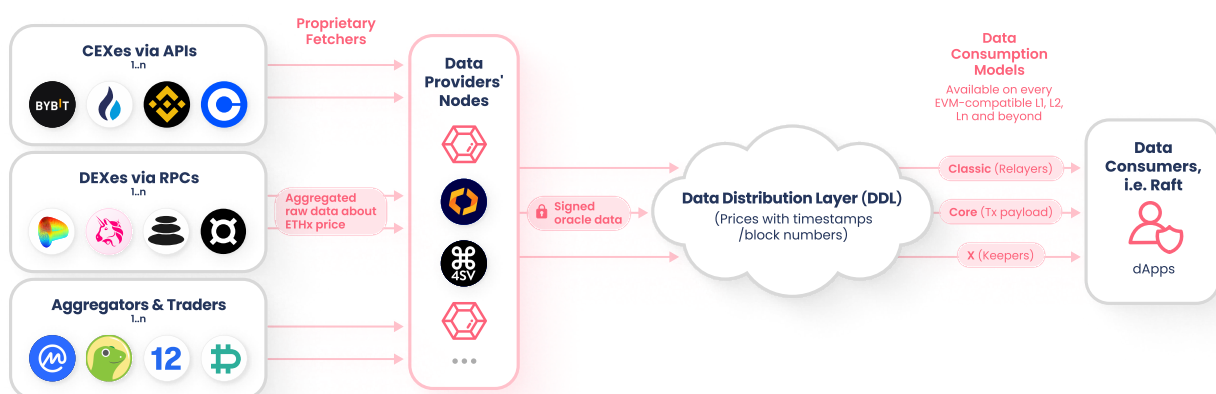
- Security:** ensuring the infrastructure cannot be compromised;
- Data Accuracy:** monitoring the flow of data and preventing tampering attempts;
- Availability:** of demanded data feeds, with desired latency, across multiple Layer1, Layer2 and Rollup-as-a-Service networks.

Currently, the most utilized Oracle feeds are price feeds of assets, i.e., BTC, ETH, Currencies, Gold, T-Bills, Stocks, and more. These price feeds are needed to calculate the value of the collateral and borrowed positions by various protocols like Lending. i.e., [Aave](#) or [Venus](#), perpetuals, i.e., [GMX](#) or [Vega Protocol](#), CDP stablecoins like [MakerDAO](#) or [Angle](#), and many more. It is loosely estimated that almost 70% of the current DeFi applications depend on price feeds delivered by Oracles. Now that we can sense the salience of Oracles, let's look at two practical examples.

LSTfi x Oracles: Stader and Raft Case Studies

In the flow, we can identify three major parties. Firstly, an organization willing to have a price feed of its asset launched, i.e., Stader's ETHx. Secondly, a protocol open to utilizing a price feed, i.e., Raft. Lastly, an Oracle is responsible for creating the feed and securely providing it to the protocol.

Circumstances alter cases, they say. On one hand, the LST project (here Stader) would like to have the ETHx price feed swiftly, to foster the growth of its adoption across DeFi. On the other, the Oracle provider has to analyze a few aspects. Is ETHx traded mostly on DEXs or CEXes? What is the liquidity depth of each source? Which sources can easily move or fade? How does the stability of the redemption mechanism work? Once the feed is created, it is vital to establish a diligent monitoring flow that is prepared for high market volatility and run crash tests. That is the exact sequence, that RedStone took when establishing the [ETHx price feed](#). Now, protocols can easily implement ETHx price feed in the [Core](#) and [Classic](#) models.



Simplified flow of [ETHx price](#) discovery and data feed delivery (Source: [RedStone Docs](#))

Alright, the data feed is ready, so now an LSTfi project (here Raft) can integrate it. The decision to do so depends either on the core team or the community that votes on adding a new feed, like on [the Raft forum](#). After the discussion period, the notion is brought to snapshot voting, which can be observed here in [the LybraDAO case](#). If the voting passes quorum and reaches the majority in favor, the implementation can start. When the integration is concluded, the protocol enables deposits in ETHx to create stablecoins against it.

8 Restaking: The Next Crypto Growth Engine

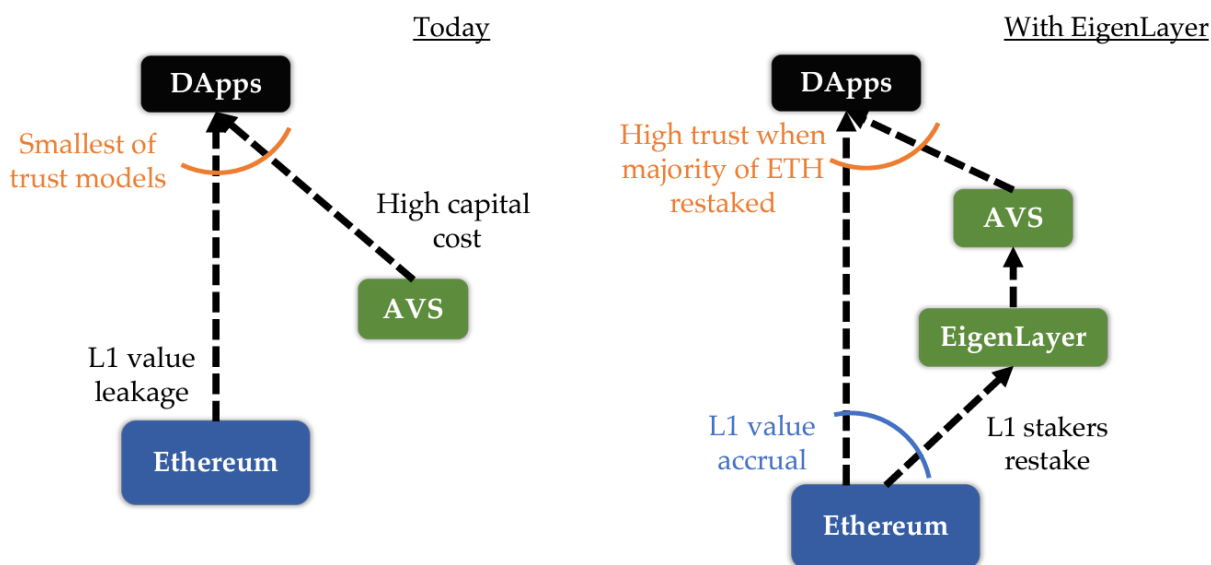
The proof-of-stake blockchains have existed since 2012 with the emergence of Peercoin. Since then, staking has become a rising trend in popularity. Firstly, node operators could deposit their coins and earn rewards for securing the network. However, not everyone could run the node or had the expertise to set it up. Hence, a more accessible version of staking appeared. The delegated proof-of-stake mechanism allowed users to allocate their cryptocurrencies to a selected validator. This way, node operators could obtain more collateral and earn higher yields while depositors could get a share of the profits. Unfortunately, both solutions required locking up coins. Initially, no one complained, but with time, it proved inefficient. The challenge brought liquid staking protocols. Thanks to them, users can deposit assets into smart contracts and indirectly secure networks. In exchange, they receive derivative tokens resembling staked tokens ownership. LSTs are liquid and tradeable. Holders can simultaneously earn staking rewards and leverage additional liquidity using extra LSTfi protocols.

Is EigenLayer The Ultimate Restaking Passkey?

You might ask, what is next? Staked assets are liquid, rewards land in users' pockets, and blockchains are secured. But crypto and distributed ledger technology is still relatively young, and the industry's great minds constantly try to innovate. EigenLayer is one of the most revolutionary protocols out there. It introduces a novel concept called restaking, which puts crypto-economic security at its core. This innovative feature allows users who have staked their ETH natively or via liquid staking tokens to participate in EigenLayer smart contracts. The protocol enables them to restake their ETH or LSTs, expanding security to multiple network applications and, thereby, earning extra rewards. Watch EigenLayer closely, as the main goal of their ecosystem is shared security and open innovation.

[EigenLayer](#) empowers Ethereum stakers to enhance the safety of various applications by restaking their ETH and concurrently opting into multiple platforms, effectively creating a shared security pool. This approach reduces the capital requirements for stakers and significantly enhances trust assurances for individual services. The protocol addresses the common issue where creators of new decentralized Ethereum services need to establish a unique trust network to secure their systems. EigenLayer eliminates this challenge by allowing any service, regardless of its nature, such as

EVM-compatibility, to access Ethereum stakers' collective security, fostering an environment for unrestricted innovation and decentralized governance.



Actively validated services today and with EigenLayer (Source: [The Restaking Collective](#))

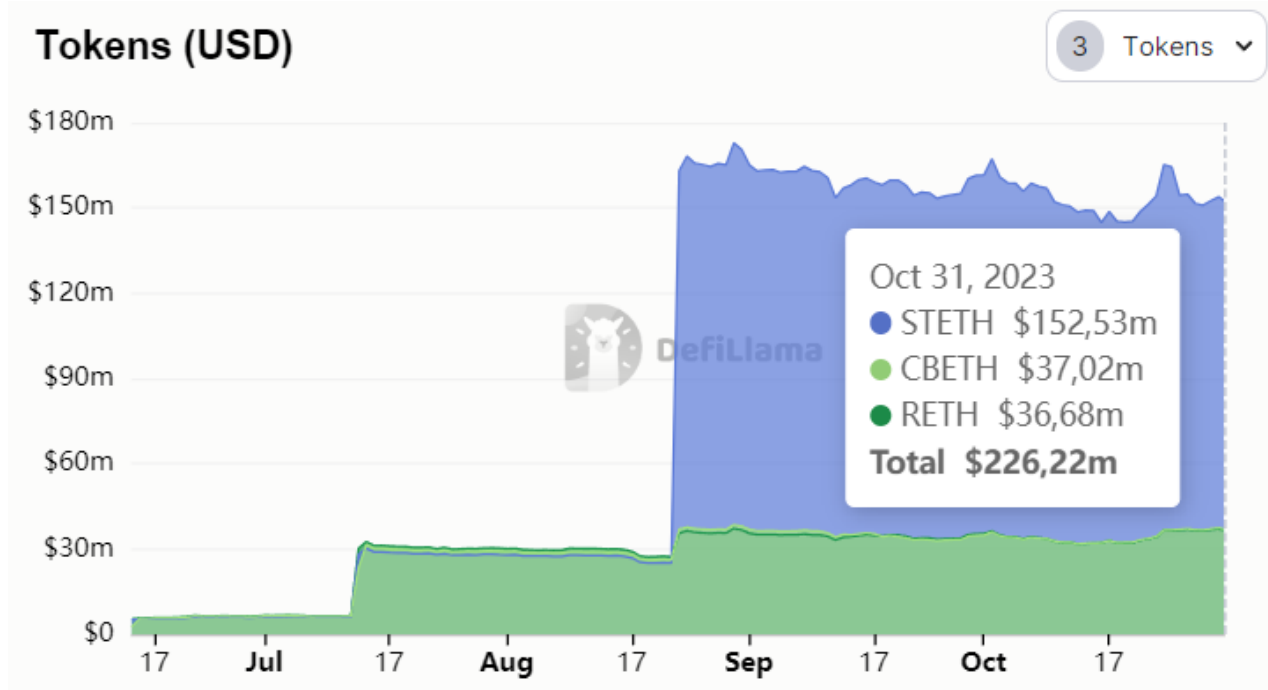
From the validator's point of view, a pooled security mechanism allows them to secure different modules by restaking ETH instead of using separate tokens. Validators provide extra security and earn income respectively. This concept expands the scope of applications that can benefit from pooled security, enabling open innovation in the blockchain ecosystem. EigenLayer introduces the second idea of an open marketplace that offers pooled security provided by validators and used by actively validated services (AVS). In this system, validators can opt in or out of different EigenLayer modules. To encourage participation, modules must offer appealing incentives. The approach benefits the crypto ecosystem by combining stable core blockchain governance with a flexible, market-driven system for launching new capabilities.

The combination of EigenLayer concepts tackles various problems, including bootstrapping new AVS, capital costs, trust aggregation and centralization, and yield generation. The protocol swoops in as an intermediary layer between the Ethereum network and other blockchain stack solutions. EigenLayer can be integrated with virtual machine programs, consensus layers, and middleware applications like bridges, and dApps.

EigenLayer offers multiple possibilities for generating yield, enabling stakers to earn additional interest while securing new AVSs. These routes include native restaking, LST restaking, ETH LP restaking, and LST LP restaking. Each path carries different risks. Module developers decide which tokens to accept as stake for their actively validated service. For instance, a module emphasizing decentralization may exclusively accept natively restaked ETH.

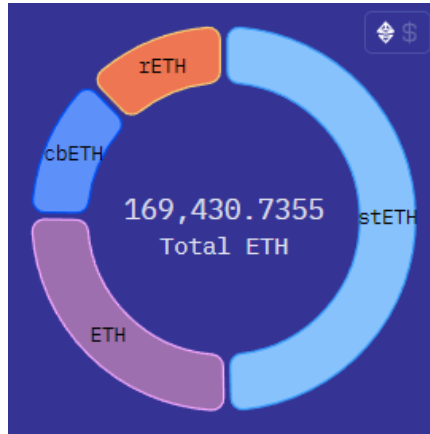
EigenLayer operates in the testnet phase as of November 2023. It has three stages with objectives to onboard stakers, node operators, and services. Stage 1 is underway with enabled liquid and native restaking. Liquid restaking is limited in a testnet period, while native ETH restaking is uncapped. At launch, available LSTs has incorporated rETH, stETH,

and cbETH. The LSTs will be added depending on [the voting](#) that concludes on November 8th. The total number of locked ETH derivatives in liquid restaking cumulated 126k LSTs and native restaking 43k ETH. For the testnet phase, these numbers are impressive. TVL reaching \$226M for liquid staking tokens already makes EigenLayer a top LST protocol. The distribution of tokens is presented in the graphics below. Especially, the chart, presenting TVL over time, provides insight into how popular EigenLayer already is. Visible jumps in value correspond to cap increase and stETH integration.



Breakdown of LSTs deposited in EigenLayer over time (Source: [DeFiLlama](#))

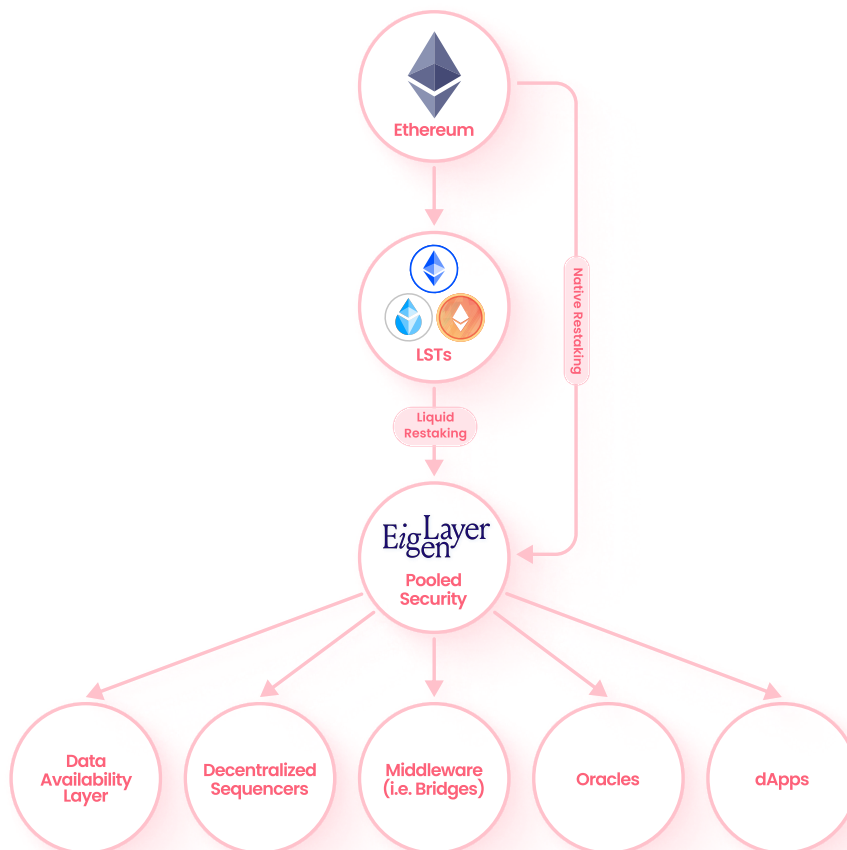
Naturally, the new restaking concept attracts attention from DeFi protocols wishing to leverage LSTs and issue liquid restaking tokens. It results in a full-blown inception by this stage. Current attempts are only in testnet stages as EigenLayer itself runs the testnet. [Astrid Finance](#) is one of the protocols developing liquid restaking solutions. It represents the liquid restaking pool on Ethereum, empowered by EigenLayer. Astrid Finance aims to provide users with the benefits of diversification and immediate liquidity for their restaking positions. In this process, users deposit LSTs (like stETH, rETH, or cbETH) into the restaking pool and, in return, receive Astrid's liquid restaked tokens (LRTs) such as rstETH, rrETH, or rcbETH. These aggregated LSTs are restaked on EigenLayer and allocated across multiple operators as determined by the Astrid DAO's vote. The rewards accumulated undergo compounding and are distributed through a rebase, ensuring that users holding LRTs witness an automatic balance adjustment. It will not take long until other protocols emerge trying to tap into the LRT market. Will it catch traction like liquid staking tokens? Time will tell, but EigenLayer, the foundation of the whole sector, must run smoothly and securely. EigenLayer itself might face direct competition in the future.



Cumulative ETH and LSTs deposited to Eigenlayer per 30th October 2023 (Source: [Eigenlayer](#))

EigenLayer enables a broad range of possibilities for new AVS across various blockchain layers, middleware, and data availability layers. These include options like a Hyperscale Data Availability Layer for high data availability, decentralized sequencers, lightweight bridges to Ethereum, fast-mode bridges for rollups, oracles, opt-in event-driven activations, MEV management, and more. EigenLayer's flexibility and use of restaking facilitate opt-in governance for different network applications, ensuring security and performance trade-offs. It also provides fast-settlement options, single-slot finality, and solutions for low-latency, high-economic finality applications.

Eigenlayer Restaking Flow



EigenLayer restaking flow (Own work inspired by: [The Restaking Collective](#))

EigenLayer establishes a decentralized trust market, connecting Ethereum stakers with modules seeking security and validation services. Through restaking, Ethereum stakers can choose to participate in securing and validating specific modules, either by directly running nodes or through delegation to other operators. This ecosystem supports lightweight and hyperscale modules designed for broad engagement, allowing for diversity among stakers regarding computational capacity, risk preferences, and identity. EigenLayer aims to foster agile, decentralized, and permissionless innovation within the crypto space. Therefore, according to this report's authors, EigenLayer may be the ultimate passkey for restaking.

Puffer tries to disrupt the Ethereum staking market with its anti-slashing design and native EigenLayer implementation. The protocol has not launched yet, but testnet is upcoming. Puffer implements various amenities, security mechanisms, and yield optimization to deliver a complex solution. The protocol leverages EigenLayer's native restaking to generate both Ethereum PoS rewards and restaking rewards for their native Liquid Restaking Token (nLRT). This is a reward-bearing token with a changing ETH conversion rate, ensuring smoother future DeFi integrations.

The protocol aims at decentralization with a broad validator set and reduced staking risks. The barrier to entry for solo stakers is lowered to less than 2 ETH through Puffer, granting higher accessibility and capital efficiency. Developers introduce an anti-slashing mechanism to protect validators called Secure-Signer, which was funded by an Ethereum foundation grant. It leverages Trusted Execution Environments (TEEs) and redirects key management and signing logic out of the consensus client into a secure Intel SGX enclave. The Secure-Signer mitigates the risk of slashing for validators by storing keys securely within encrypted memory, accessible only during runtime for signing non-slashable transactions. This approach prevents accidental double-signing and safeguards keys from misuse across different consensus clients, enhancing overall node security even in case of system compromise. As a result, the Puffer Pool can reduce bond requirements and improve validator safety.

Puffer develops a native liquid restaking protocol on EigenLayer, with all nodes eventually becoming restakers for increased returns. Nodes will operate actively validated services (AVSs). The Puffer Protocol follows three core principles: enhancing capital efficiency by reducing the bond requirement, increasing economic opportunities for node operators, and improving hardware efficiency. It ensures more participation and profitability for Ethereum validators and web3 infrastructure providers.

EigenLayer Case Study: Oracle Utilizing Restaking & Data Availability

One of the sectors that could benefit most from the restaking mechanisms is blockchain Oracles. These services play a crucial role in ensuring the safety of DeFi protocols by providing accurate data feeds, currently mainly price information on assets, i.e., BTC, ETH, stETH, gold, and many more.

That provokes a question of who actually underwrites the safety of Oracles. If the amount of capital that secures Oracle nodes with staking is less than the total value secured (often referred to as TVS), it would be economically profitable to gain control over an Oracle network and extract value from secured protocols. On the other hand,

requiring Oracles to lock in their tokens a value corresponding to the total TVS could greatly increase capital cost and render the service too expensive to use.

EigenLayer could be the silver bullet to solve Oracle's security vs capital cost dilemma. The restaking mechanism via AVS allows for reducing the cost of capital needed to properly incentivize the honest behavior of Oracle nodes. Some Oracle projects actively explore architecture and implementation steps for such design. For example, this report's publisher RedStone Oracles, works currently on prototyping the AVS-based consensus mechanism among data provider's nodes to be deployed as an extra security measure powering data aggregation among multiple parties. Moreover, the EigenLayer's Data Availability (DA) layer, called [EigenDA](#), could be a well-fit solution as a storage layer for some Oracle data. Therefore, the RedStone team also explores leveraging EigenDA in lowering costs of the [Data Distribution Layer](#) (DDA), its off-chain component.

That being said, it is still early days for that technology to fully assess benefits and potential risks. Therefore, it is difficult to specify exact numeric values for the AVS flow by now. Undoubtedly, the upcoming months will show more and more innovation in the EigenLayer and Oracles sector.

9 What Can We Expect Next in The LSTfi Space?

*"LSTs are bridging lucrative technological advancements around Proof of Stake to the financial sector. I believe there will be hundreds of structured products built on top of base staking rewards to cater to an exhaustive range of investors on the risk/reward spectrum from A - Z," said **Mirko Schmiel, Staking Rewards CEO & Co-Founder**.*

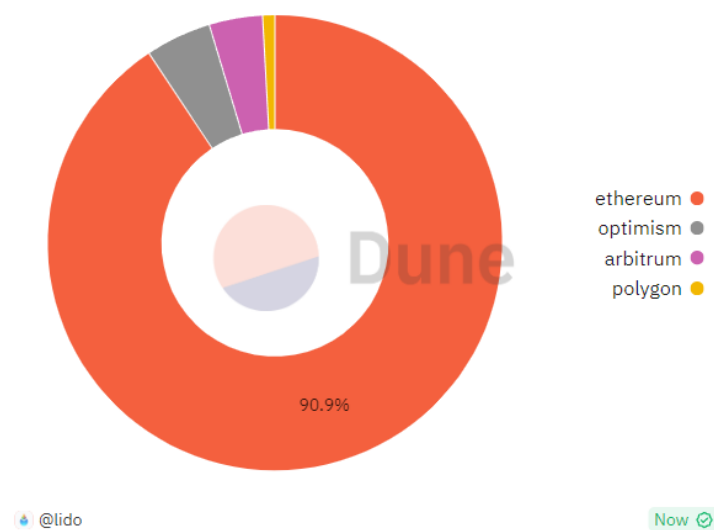
In short, one of the narratives will be availability. That means bridging LSTs across rollup layers, so Layer 2s, Layer 3s, and so on, but also across other Layer 1s. Lido can be a great example of that movement. Both stETH and wstETH, are widely integrated with various DeFi protocols. Especially wstETH, due to its non-rebasing design and less complicated platform integration. Not only are Lido's products popular among other decentralized projects, but they are available on different networks. Besides Ethereum, wstETH is prevalent on chains such as [Optimism](#), [Arbitrum](#), [Polygon](#), and [Mantle](#). Check out the graph below. They represent the lion's share of the Layer 2 networks market. Therefore, liquid staking gradually gains traction and becomes more accessible. Users can bridge wstETH or purchase it directly on a selected blockchain. Layer 2 utilization might come in handy in more euphoric crypto market conditions. Investors would not have to spend astronomical sums of money for gas and weep each time they interact with DeFi platforms. Furthermore, LST holders would have a more pleasant time using LSTfi protocols.

In addition, Lido provides wstETH on other blockchains, even non-EVM Layer 1s. Since recently, wstETH has been obtainable on [Cosmos](#). The wstETH Cosmos bridge was

developed in partnership with Neutron and Axelar and introduced Lido's staked ETH to the Interchain ecosystem, bolstering liquidity and stability for staked Ether. Its core objective is to extend staked ETH utilization into complementary ecosystems. This bridge offers in-flight staking capabilities, single transaction conversions of unstaked ETH to wstETH via Neutron, and supports cross-chain governance. While wstETH has already made its presence on networks like Optimism, Arbitrum, and Polygon, this expansion into Cosmos represents a significant step towards bridging the Ethereum and Cosmos DeFi ecosystems.

Mantle, on the other hand, is an optimistic rollup and EVM-compatible Layer 2 network collaborating with Lido to bridge wstETH to its ecosystem. Mantle LSD focuses on harnessing product synergies and fostering the internal ecosystem. It will incorporate mETH into Mantle Network in the future and establish collaborations with node operators and DeFi applications.

Current liquidity reserves: breakdown by blockchain



Liquidity of Lido's wstETH by chain (Source: [Dune](#))

The crypto ecosystem is also expecting some ways of LSTfi & RWA combination. One such idea would be the creation of a protocol adjusting its yield strategy based on both of these asset classes. In practice, the protocol could simply swap between a normalized LST and RWA yield, based on which one is at a higher time-weighted level. The opportunities are far beyond that. Only time will tell if and how they will materialize.

RWA Report:

The Deep Dive into 2023 Market



Delve deeper into the topic of RWAs by reading [the RWA Report](#)

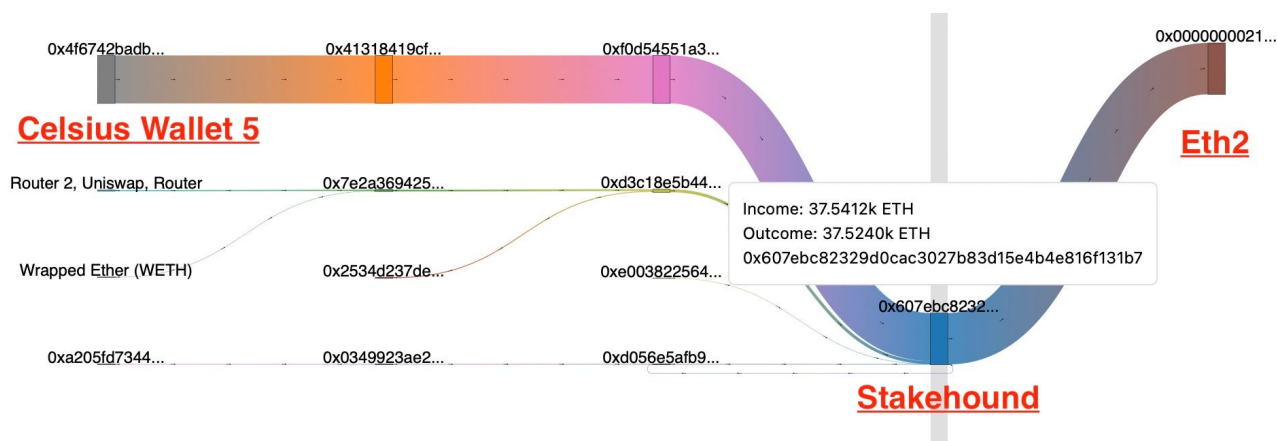
10 Risks

Let us start the risk section with a real story that is hard to believe. [StakeHound](#), one of the early liquid staking platforms, [announced its stETH LST](#) on November 24th, 2020. Wait a minute, that trademark sounds familiar. You are right, Lido and StakeHound argued about the “stETH” trademark on Twitter (now X) and even involved legal counsel on both ends (read more [here](#)). The conflict over the name ended unresolved, but it does not matter much. One of the well-known risks of crypto as an industry materialized on May 2nd, 2021. According to [StakeHound’s statement](#), the company was informed by one of their custody providers, Fireblocks, that 38,178 of their staked ETH, worth nearly \$72 million at the time of writing, may have been rendered inaccessible because of a failure by Fireblocks to secure the cryptographic keys as they had been required to do. Assumably, a series of errors by Fireblocks caused the loss of 2 keys that were part of the 3-of-4 threshold signature for the shards that formed the StakeHound’s withdrawal key. The aggrieved party claimed that Fireblocks (1) did not generate their private keys in a production environment, (2) did not include the private keys required to decrypt their 2 key shares in the backup, and (3) lost both keys.

Did you know?: It is estimated that [about 20% of all bitcoins](#) are inaccessible and lost forever.

As a next step, StakeHound [filed a lawsuit against Fireblocks](#) at the Tel Aviv District Court on the grounds of alleged negligence. Eventually, on [July 26th, 2021](#), StakeHound decided to discontinue their liquid staking activities and devote their full attention to the recovery of the loss, which never happened. [Here](#), you can see StakeHound’s TVL chart, on which DeFiLlama decided to index 0, even though the money still sits on the contracts to which no one has effective access keys. That sad story has one more angle. On [July 11th, 2023](#), the bankrupt crypto lender Celsius sued StakeHound over the platform’s alleged failure

to return \$150 million worth of tokens. That story should be a reminder of inherited risks in the crypto nature.



Celsius' 35,000 ETH transactions path that got lost in StakeHound key loss (Source)

Centralization of assets is one of the main aspects the LST market faces. Lido has a substantial market share regarding the ETH staked. Of course, it is not their fault they managed to attract so many users and deposits, it rather shows market conviction to the quality of their ecosystem. Nevertheless, any problems related to that protocol can affect the entire liquid staking industry. Some critics point out inadequate number of nodes to the size of funds deposited. For instance, Lido has 39 node operators at the time of writing and Rocket Pool, the decentralization maxis, has 3000 node operators. There are two sides to every story, with more nodes come new challenges and risks. The permissioned versus permissionless nature of LST protocols also plays a crucial role. Although a permissionless design is what DeFi strives for, it is harder to scale due to its inherently trustless operations.

LST protocols essentially provide leverage, using Ethereum's security design, the proof-of-stake consensus mechanism. They create a highly interconnected environment in combination with LSTfi platforms that utilize liquid staking tokens. A hiccup from one of the top or bottom protocols can influence the whole market. LSTfi protocols use one another to increase yield and offer the highest possible rewards. Security should be the top priority for every project to ensure users' funds' safety. Unfortunately, regular Joe is not equipped to verify each protocol's security and audits. DeFi users have to trust auditing companies they are conducting thorough work.

The protocol-wide risks encompass issues like controlling an excessive portion of the stake, which could compromise finality and impact the fundamental principles of decentralization, neutrality, and openness in Ethereum. Protocol-wide risks are a critical facet of any blockchain system. When one entity possesses more than 30% of the total stake in a proof-of-stake network, it creates the potential for significant control over the entire ecosystem. The implications of this are far-reaching and can be problematic. One concerning scenario is the ability to manipulate finality. By controlling a substantial portion of the stake, an entity could potentially halt the finalization process, holding the chain hostage. It not only disrupts network operations but also compromises the blockchain's integrity and security. We are not implying that Lido is a "bad guy" here. Any party holding such a substantial part of the network security has to be observed for the sake of ecosystem soundness.

LST ETH peg arbitrage is a topic that comes into play when considering the stability and value of these assets. Understanding the dynamics of arbitrage opportunities is crucial for maintaining the peg's integrity. Although specialized protocols emerged to earn on the arbitrage opportunities, the deviations will occur. It is the space where the part of the oracles is crucial. Lastly, the LST type can influence the taxing obligations. Non-rebasing tokens involve relatively simpler processes, occurring primarily at the start of staking and the point of unstaking. In contrast, rebasing tokens introduce a layer of complexity to these events due to daily balance changes.

Do Not Overload Ethereum's Consensus ~ Vitalik Buterin

One could say: To stake, or not to stake, that is the question. The dual-use of validator-staked ETH is an intriguing concept carrying benefits but also risks. It is reasonable to leverage this approach within certain boundaries. Particularly if the protocol's design ensures any failures or losses remain confined to the validators and system users. Such an approach is inherently low-risk, as it does not entail broader implications for the Ethereum ecosystem's social consensus.

Conversely, when the intention is to gain support from the larger Ethereum community or manipulate the social consensus for the protocol's own objectives, it becomes a high-risk endeavor. This type of maneuver should be met with strong resistance, as it jeopardizes the stability and integrity of the Ethereum network.

Ethereum validator set utilization to enhance security for other chains does not prevent all the attacks. It may protect against 51% finality-reversion attacks but falls short in guarding against 51% censorship attacks. In scenarios where Ethereum validators are already part of the equation, a potential solution could involve transitioning into a validium framework. It is a scaling solution that uses off-chain data availability and computation to process transactions, e.g., zero-knowledge rollups.

Developers are tempted to expand the blockchain's core functionality to cater to a growing range of use cases. However, each extension introduces complexities that could render the core system more vulnerable. A minimalistic design is advisable to safeguard the blockchain's integrity. Restaking experiments should not infringe on the Ethereum consensus model. Developers ought to seek alternative security approaches, ultimately fostering a more robust and secure ecosystem.

Restaking, although a promising innovation, introduces potential additional vulnerabilities. It imposes leverage on staked ETH and argues with Vitalik's point of view to build robust, secure, and minimalistic blockchains. Slashing incidents are another fear associated with restaking. Protocols like EigenLayer want to provide other networks with Ethereum's validator set. There is a potential danger of slashing for non-performance, and restakers have extra requirements to meet. Expanding Ethereum's consensus responsibilities adds costs and complexities for validators. It forces them to manage additional software, monitor new protocol updates, and ensure proper behavior, increasing operational challenges. All things considered, restaking is a captivating concept worth pursuing. However, security must be the leading virtue to follow.

“The reason I personally am not just staking all of my ETH (...) is because if you stake your ETH, it has to be all out, like the keys that access it have to be public on some system that’s online, and for safety it has to be a multi-sig, and multi-sigs for staking are still fairly difficult to set up, and it gets complicated in a bunch of ways,” said **Vitalik Buterin, Ethereum Co-founder.**

11 Conclusions

To sum up, liquid staking tokens play an essential role in the DeFi ecosystem, offering users a way to participate in cryptocurrency staking without the traditional hassles of running validator nodes and managing hardware and software. LSTs, such as stETH, rETH, sfrxETH, cbETH, swETH, and others, represent ownership of staked digital assets while ensuring liquidity, making them a win-win for users. Liquid staking has rapidly gained popularity, with a significant Total Value Locked (TVL) and widespread adoption in decentralized finance. The various LST types, including rebase tokens, rewards-bearing tokens, wrapped tokens, and the dual-token model, offer users flexibility and choices, catering to different preferences and risk profiles. As the DeFi landscape continues to grow, liquid staking tokens will keep providing users with opportunities to earn rewards and participate in cryptocurrency staking with ease.

The Ethereum ecosystem has witnessed significant growth and innovation regarding LSTs. These protocols have revolutionized the staking landscape, making it more accessible and flexible for users. Lido, as a leader in the field, has played a vital role in offering user-friendly staking solutions. Rocket Pool, Frax Finance, Stader, and Ankr have all contributed to expanding the LST market by providing a diverse range of services. Diva focuses at Distributed Validation Technology (DVT) to enhance security and performance. Ether.fi stands out for its restaking capabilities, allowing users to earn rewards while staking. Liquid Collective bridges the gap between DeFi and institutional requirements, promoting deep liquidity. Additionally, Swell and StakeWise bring innovation with gamification and enhanced flexibility. As the LST ecosystem continues to evolve and attract users, these protocols will play a crucial role in shaping the future of staking in the crypto space.

LSTfi represents a fascinating subsector of decentralized finance that leverages the utility of liquid staking tokens and innovative yield strategies. LSTfi enables cryptocurrency holders to make the most of their staked assets by participating in various DeFi applications, including lending, stablecoin generation, liquidity provision, and leverage trading. While the LSTfi market share is relatively small, it is a dynamic and rapidly developing sector. With a diverse range of LST-backed stablecoins like eUSD, R, GRAI, crvUSD, mkUSD, and the upcoming USDe, LST holders have numerous options for enhancing their yield. Additionally, the emergence of earning platforms such as Pendle, Sommelier, CIAN, Asymetrix Protocol, and Tokemak further expands the possibilities for maximizing returns.

LST indexes, similar to traditional ETFs, provide a convenient entry point for investors. Each derivative has its unique risk profile, requiring careful evaluation. Projects like dsETH and icETH by Index Coop, as well as unshETH, provide diversified exposure to staking tokens, catering to different investor preferences. Additionally, platforms like Enzyme,

Yearn Finance, and Origin DeFi introduce their LST indexes, each offering distinct features. In the lending sector, major protocols like Aave, Compound, Venus, Spark Protocol, Silo Finance, and Alchemix include LSTs, offering a range of lending options. However, participants should approach this space with due diligence and an understanding of the associated risks. Caution, research, and risk management are crucial in this dynamic sector. In this ever-changing DeFi landscape, LSTfi emerges as an exciting destination to watch and engage with.

Blockchain Oracles are part and parcel of LSTfi, ensuring security, data accuracy, and availability for various DeFi applications, with price feeds being instrumental for collateral valuation. Approximately 70% of current dApps rely on Oracle-delivered price feeds. Examining practical case studies like Stader and Raft, we see the intricate process of creating and integrating price feeds, emphasizing the critical role of Oracles in the DeFi ecosystem. These well-orchestrated efforts enable LSTfi projects to offer innovative features and expand adoption, highlighting the collaborative nature of the crypto space.

The evolution of staking within the crypto space has brought us to the doorstep of a groundbreaking concept – restaking. EigenLayer's innovative approach, allowing Ethereum stakers to participate in shared security pools and explore diverse applications, holds the promise of greater accessibility, trust assurances, and economic opportunities. This novel concept can reshape the landscape of DeFi and Oracles, offering solutions to long-standing challenges in capital efficiency, trust, and yield generation. EigenLayer's emergence as a decentralized trust marketplace and its integration into various blockchain layers is a significant step towards advancing the crypto ecosystem's innovation and decentralization.

In the LSTfi sector, accessibility, and cross-chain availability stand out as key trends to watch. Projects expand the reach of liquid staking tokens, such as wstETH, across various Layer 2s and even non-EVM Layer 1s, making DeFi interactions more cost-effective and user-friendly. Additionally, the potential integration of LSTfi and real world assets (RWA) presents exciting opportunities, with protocols adapting yield strategies to maximize returns based on both asset classes.

The liquid staking DeFi space presents a promising frontier for the blockchain industry, but not without its share of challenges and risks. The unfortunate incidents involving StakeHound underscore the need for robust security measures and trust in the custody of assets. Centralization and governance issues raise concerns over the long-term sustainability of these platforms. While the success of platforms like Lido is a testament to their appeal, it highlights the risk of potential protocol issues impacting the broader liquid staking ecosystem. Furthermore, LST protocols and LSTfi platforms create an interconnected environment where the performance of any constituent element can significantly influence the market. Specific risk categories include individual staker risks, correlated slashing, and protocol-wide risks associated with excessive stake control. In addition, the risk of arbitrage deviations and the complexities introduced by liquid staking tokens require vigilant monitoring and management.

The expansion of Ethereum's validator set through restaking offers exciting possibilities but demands a meticulous approach to security and operational challenges. While it can mitigate certain attacks, such as 51% finality-reversion attacks, it is not a panacea against all threats, particularly 51% censorship attacks. The transition to validium

frameworks may offer a more secure path forward, emphasizing the importance of a minimalist design to maintain blockchain integrity. While restaking holds promise, it must prioritize security and address potential vulnerabilities, such as the risk of slashing and the increased operational complexity for validators.

In conclusion, all new technology carries risks and vulnerabilities. Some breakdowns and mistakes are impossible to predict before launch. However, crypto and DeFi are spaces that learn from the failures the fastest. Therefore, any mishaps should not hinder innovation and zeal in protocol development. DeFi users wait for and crave the novelties. As the projects emerge, we can observe how decentralized finance becomes more and more intertwined. Time will tell how robust and secure the entire DeFi ecosystem will turn out. To summarize, let the innovators create new concepts and skeptics question them to get a truly groundbreaking technology.

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About Authors

RedStone is a modular oracle delivering diverse, high-frequency data feeds to all EVM Layer1, Layer2, Rollup-as-a-Service networks and beyond, i.e., Starknet, Fuel Network, or TON. By responding to market trends and developer needs, RedStone is capable of supporting assets not available elsewhere. The modular design allows for **data consumption models** adjusted to specific use cases, i.e., capital efficient LSTfi. RedStone raised almost \$8M from Lemniscap, Blockchain Capital, Maven11, Coinbase Ventures, Stani Kulechov, Sandeep Nailwal, Alex Gluchovski, Emin Gun Sirer, and other top VCs & Angels.

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Resources

If you'd like to partner with the RedStone team on the next research pieces let us know in the form below. If you like the report or have any comments, share your feedback in the form too!

<https://forms.gle/wuih7AyiP42qi4xS7>