# AAVE — Research Document (14.09.24)

## Project Overview

- Aave enables decentralized lending and borrowing, allowing users to earn yield and access liquidity without intermediaries. Aave V3 adds features like flash loans and cross-chain liquidity, serving both retail and institutional users.
- Aave is community-driven governance via the AAVE token, where holders vote on protocol changes, asset onboarding, and risk management.
- **Problems Solved:**
  - **Decentralization:** Aave removes intermediaries, reducing fees and access barriers, while providing transparent liquidity.
  - **Liquidity Fragmentation:** Aave's cross-chain capabilities reduce liquidity fragmentation, ensuring liquidity flows across blockchains.
  - **Interest Rate Flexibility:** Users can switch between stable and variable interest rates, optimizing borrowing costs.
- **Future Roadmap:**
  - implementation of Aave V4 will improve capital efficiency with a modular design, dynamic interest rates, smart accounts, and better GHO integration. Development starts in 2024, with release by mid-2025.
  - The Aave 2030 plan aims to scale Aave to a billion users through innovations like Aave V4, cross-chain liquidity, RWAs, and GHO, with a focus on decentralization and community-driven development over next years.

## Market & competitors

- Key Competitors:
  - **MakerDAO**:
    - **Core Functionality**: MakerDAO is a decentralized platform that primarily enables users to mint **DAI**, a decentralized **stablecoin** pegged to the US dollar. Users can deposit collateral (mainly **ETH** and other selected assets) to generate DAI, which

provides a stable medium of exchange within the decentralized finance (DeFi) ecosystem. The system relies on **over-collateralization** to ensure the stability of DAI, where users must lock in more value than the amount they wish to borrow.

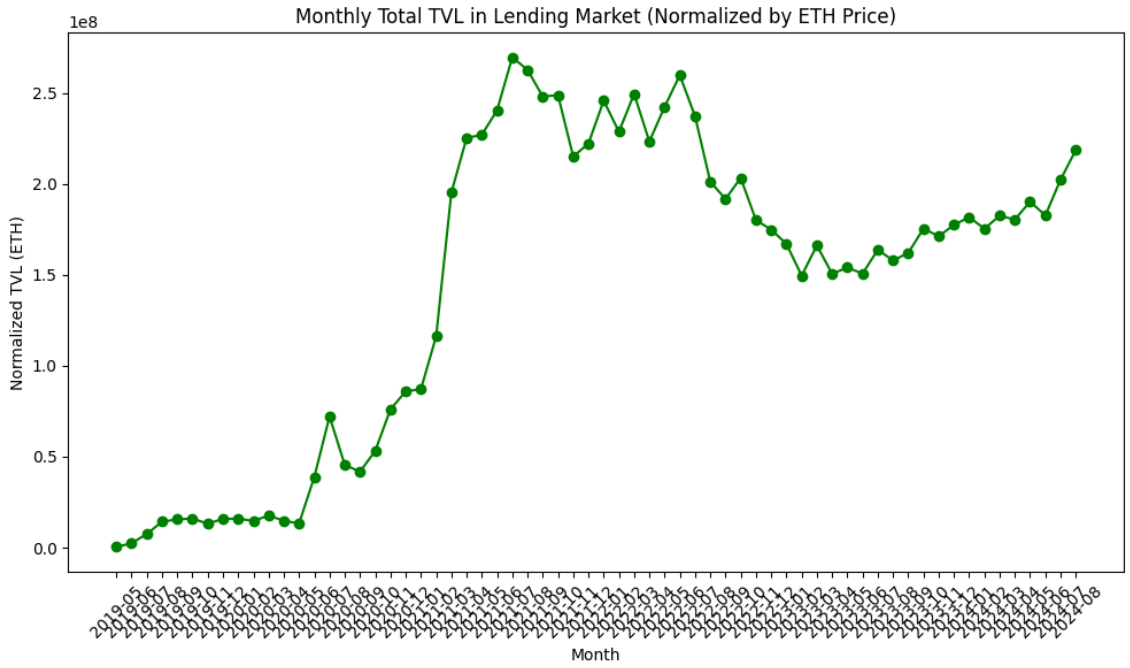
        - **Key Features**: DAI stability is maintained through a system of **smart contracts** and external actors called **keepers**, who are incentivized to liquidate under-collateralized loans. **MKR** token holders govern the protocol, deciding on crucial parameters such as interest rates (Stability Fee) and collateral types. MakerDAO's primary value proposition is **stability yield** in this volatile cryptocurrency market.
    - **Compound**:
        - **Core Functionality**: Compound is a **lending and borrowing platform** where users supply cryptocurrency to a pooled liquidity market, earning interest on their deposits. Borrowers can take out loans from the pool by collateralizing their assets. The interest rates in Compound are automatically set by algorithms based on **supply and demand**. The system works by converting supplied assets into **cTokens**, which represent a claim on the underlying assets and accrue interest over time.
        - **Key Features**: The platform's core innovation lies in its **algorithmically determined interest rates**, which dynamically adjust based on market conditions. Compound supports various cryptocurrencies, and its governance is decentralized, allowing **COMP** token holders to vote on protocol changes. It is focused on high liquidity and simplicity, making it user-friendly and efficient.
    - **Honorable mentions: Morpho, Spark & Venus**

- **Comparison between Maker, Compound and AAVE:**
    - **Lending & Borrowing Mechanisms:** MakerDAO is best for stability-focused users comfortable with complexity, Compound suits those seeking simplicity and automation, while Aave offers advanced flexibility with features like flash loans.
    - **Interest Rates:** MakerDAO is ideal for users wanting stable, predictable borrowing costs, where Compound is for users preferring market-driven rates, and Aave has built products that enable flexibility and control over interest rates.
    - **Collateral and Liquidation Process:** MakerDAO is ideal for users who prioritize stability, offering higher collateral requirements and a more intricate liquidation process. Compound caters to those seeking low-maintenance, automated collateral management, while Aave provides flexibility in collateralization, with lower penalties and a wider range of supported assets.
    - **Supported Assets and Governance:** MakerDAO is optimal for users focused on stability with a smaller asset selection, while Compound offers efficient governance

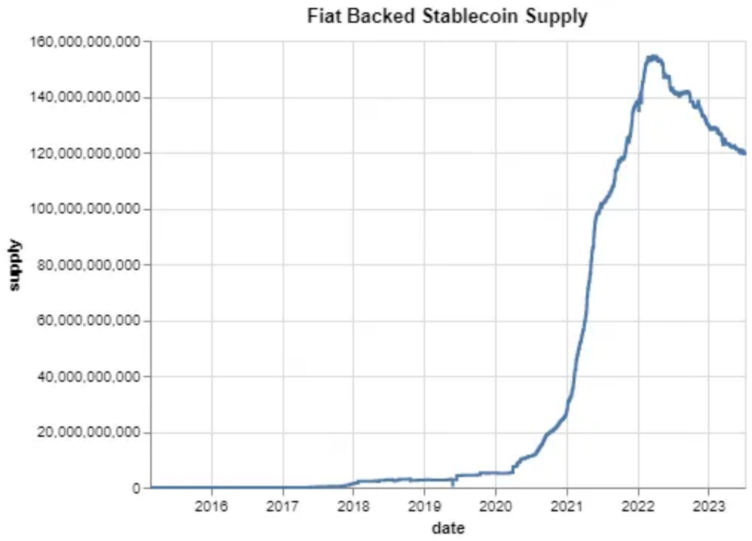
with a broader, though still limited, range of assets. Aave stands out for users seeking a wide variety of assets and flexible, user-driven governance.

- **Aave's Unique Selling Points:**
  - **Diverse Asset Offerings**: Aave supports a wide variety of assets, including major cryptocurrencies and stablecoins. Also, its eMode allows users to borrow more efficiently within correlated asset categories like stablecoins.
  - **Creator of flash Loans**: These uncollateralized loans must be repaid in the same transaction and are typically used for arbitrage, refinancing positions, or quick liquidation management.
  - **Cross-Chain Functionality**: Aave's v3 Portal facilitates seamless cross-chain liquidity transfers, making it attractive for users operating across multiple networks.
  - **Isolated Pools**: Aave enables more agile onboarding of new collateral assets with isolated risk pools, a feature that limits systemic risk across the protocol.

- **Market Size and Growth Potential**:
  - The lending market is the second most important sector according to DeFillama. It currently represents barely $32B in Total Value Locked. Within this sector, AAVE is the current leader project, by representing more than 30% of the total valued deposited by DeFi users.



- The stablecoin market, now a crucial part of the crypto ecosystem with over $120 billion in market cap, accounts for 10% of the total crypto market. Dai competes with fiat-backed stablecoins like USDT and USDC, but its crypto-collateralized nature appeals to users seeking decentralized alternatives.



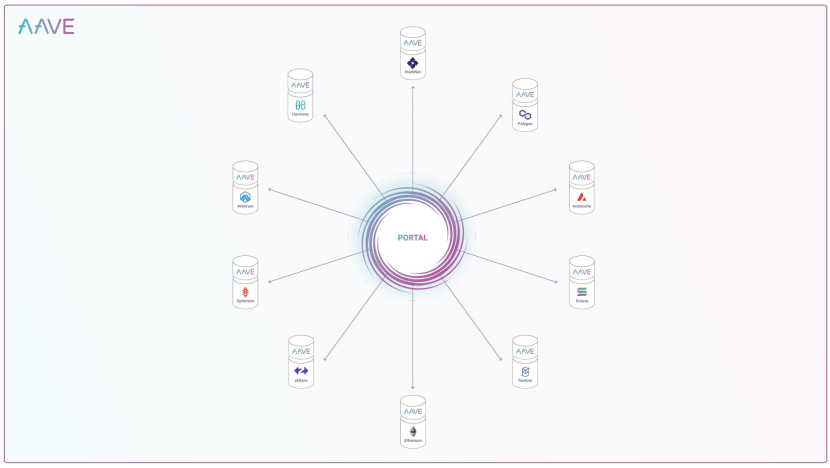

- Also, MakerDAO's focus on real-world assets (RWA) offers significant growth potential by bridging decentralized finance with traditional markets since this narrative has been fueled by several important partnerships with famous names in traditional finance like BlackRock.

## Technical Overview

- Aave is a decentralized liquidity protocol that operates on multiple blockchains, including Ethereum, Polygon, Avalanche, Arbitrum, Optimism, and others. The protocol facilitates borrowing and lending of digital assets, offering advanced features like flash loans, eMode, Isolated markets, over-collateralized borrowing, and decentralized oracles. Specifically, the release of Aave V3 brought significant upgrades aimed at enhancing interoperability, capital efficiency, and security.

- **Key Features of Aave V3**:
  - **aTokens**: The yield-generating, tokenised deposits used throughout the Aave protocol. They implement most of the standard EIP-20/ERC20 token methods with slight modifications. All aTokens also implement EIP-2612, which via the "permit" function enables gas-less transfers and single transaction approve + actions.

- **Stable and Debt tokens**: The tokenised borrow positions used throughout the Aave protocol. Most of the standard EIP-20/ERC20 methods are disabled, since debt tokens are non-transferrable.
- **Credit Delegations**: Allowing a depositor to deposit funds in the protocol to earn interest, and delegate borrowing power (i.e. their credit) to other users. The enforcement of the loan and its terms are agreed upon between the depositor and borrowers, which can be either off-chain via legal agreements or on-chain via smart contracts.
- **Portals**: Aave V3 introduces *Portals*, a cross-chain liquidity feature that allows whitelisted bridges to facilitate seamless liquidity transfer across blockchains. By using Portals, bridges such as Connext and Synapse can tap into Aave's liquidity on different chains to execute cross-chain transactions. Portals mint unbacked aTokens on behalf of users on the target chain, using liquidity from Aave on the source chain. This approach enhances the interoperability of liquidity across chains and improves capital efficiency without reliance on liquidity mining programs.




- **eMode (Efficiency Mode)**: The eMode feature maximizes capital efficiency by allowing users to borrow higher amounts when their collateral and borrowed assets are highly correlated. For instance, stablecoins pegged to the same asset (like USD) benefit from increased loan-to-value (LTV) ratios. This reduces the risk of liquidation since both assets will likely move in tandem during price fluctuations. Aave V3 allows up to 95% LTV for these correlated asset categories.
- **Isolated Markets**: Aave V3 introduces *Isolated Markets*, a feature that allows governance to add new collateral assets with limited risk exposure. In isolated markets, a specific asset is allowed to be used as collateral, but it can only be borrowed against a predefined set of stablecoins. The isolated market comes with a debt ceiling, capping the total value that can be borrowed against risky or new assets. This design promotes

the listing of more experimental tokens without exposing the broader ecosystem to excessive risk.


- **Flash Loans**: Aave pioneered *flash loans*, a feature allowing users to borrow funds without collateral, provided they repay the loan within the same transaction block. Flash loans are used for arbitrage, collateral swaps, and liquidations. They have been integral in DeFi for executing complex transactions, but they also introduce risk, as they have been exploited in several attacks across the ecosystem.
- **Over-Collateralization**: Aave uses an over-collateralization mechanism to protect lenders. Borrowers are required to post collateral worth more than the borrowed assets. In case of a price drop in the collateral, liquidation occurs to ensure lenders are repaid. The Health Factor tracks the safety of a borrower's position and triggers liquidation when the ratio falls below 1.
- **Decentralized Oracles**: Aave leverages Chainlink's decentralized oracle network to secure price feeds. This ensures accurate and timely pricing for assets used as collateral within the protocol, minimizing the risks of price manipulation and erroneous liquidations.
- **Treasury**: It is primarily funded through a portion of the protocol's revenue, which is generated from interest rate spreads between borrowers and lenders, liquidation fees, and other sources such as flash loans. The AAVE Treasury is used to cover protocol expenses, including development, governance initiatives, and security audits. It also serves as a safety net, strengthening the protocol's resilience by ensuring there are funds available for contingencies, such as replenishing the Safety Module in the event of shortfalls.

## Governance & Decentralization

Governance Process


- Aave is governed by its community through a **Decentralized Autonomous Organization (DAO)**. AAVE token holders actively participate in the governance process by voting on **Aave Improvement Proposals (AIPs)**, which directly influence protocol upgrades, risk parameters, treasury allocations, and other significant decisions. This community-led governance ensures transparency, decentralization, and alignment of the protocol's goals with its users' interests.
- **Governance Mechanism:** Aave employs a **two-tiered governance structure**, where **AAVE and staked AAVE (stkAAVE)** holders have distinct powers:
  - **Proposal Power**: Token holders can submit proposals, ranging from protocol upgrades to changes in the platform’s risk parameters.
  - **Voting Power**: Token holders cast votes to approve or reject proposals. The more AAVE a user holds, the more voting weight they possess. This allows for proportional representation in decision-making.
  - Each governance proposal passes through several stages, including **discussion, voting, and implementation**. Proposals that reach the required quorum and receive majority approval are implemented on-chain. In some cases, the **Guardians** (community multisig account) can intervene to cancel malicious proposals, providing an additional layer of security.
- **DAO Structure and Benefits:** Aave's governance is designed to be **highly transparent and decentralized**. The decision-making process is public, with all discussions and votes happening on-chain. This openness ensures that all community members can access critical information and contribute to governance discussions.
  The DAO structure also enables
  **institutional involvement**, with several professional institutions and third-party teams contributing to Aave’s governance. These contributors provide risk management services, market-making, and financial advice, which helps maintain the protocol's robustness.

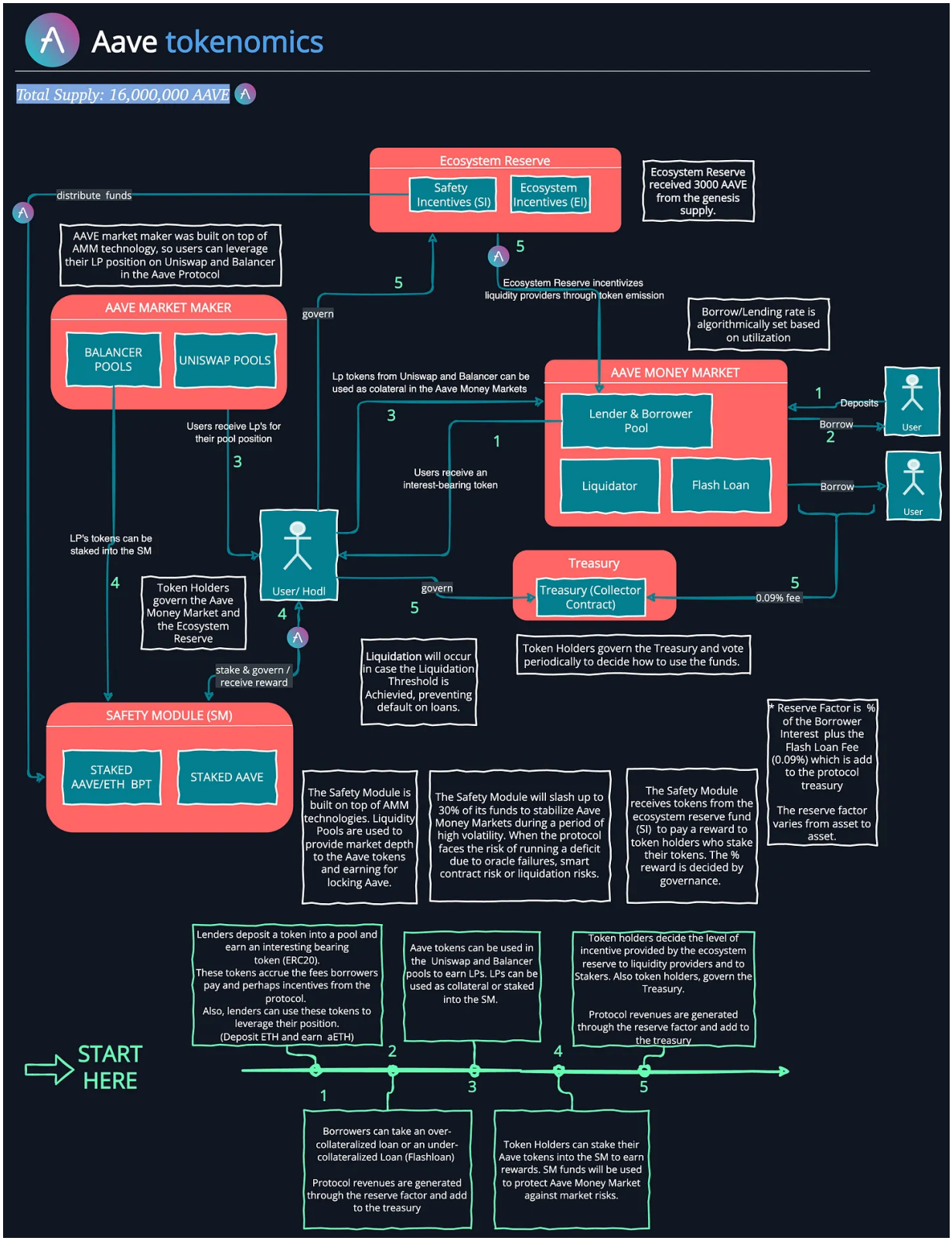
- **Key Roles and Features from DAO:**

    - **Facilitators**: Specific entities approved by the DAO that can mint or burn assets such as GHO, Aave's decentralized stablecoin.
    - **Delegators**: AAVE holders can delegate their voting and proposal power to trusted entities, enabling professional governance without active participation from every holder.
    - **Safety Module**: Aave's staking mechanism, where holders stake AAVE to secure the protocol. In case of a shortfall event, staked AAVE may be used to cover losses, aligning the incentives of stakers with the overall health of the platform.

- **Recent dispute in the DAO: Gauntlet ends its partnerships (February 2024)**
    - Gauntlet, which is a blockchain risk management firm, has announced it is withdrawing from its role as Risk Steward for Aave, citing governance and operational challenges after a four-year partnership.
    - The decision was influenced by difficulties in navigating inconsistent guidelines and unwritten objectives from Aave’s major stakeholders over the past year, as shared by Gauntlet co-founder John Morrow.
    - Gauntlet had been responsible for overseeing Aave’s risk levels and providing risk management services. It now seeks a replacement for this role, marking a significant shift in Aave’s decentralized governance.
    - The announcement sparked mixed reactions, including disappointment from Aave’s former CTO, highlighting the complexities of DAO partnerships and trust management.

- Finally, Aave's governance model allows the protocol to remain **adaptive and community-driven**, ensuring that decisions are made with broad input from token holders and aligned with the long-term goals of the platform. This decentralized governance structure is a critical element of Aave’s success and sustainability, fostering a sense of ownership and engagement among its users.

## Tokenomics

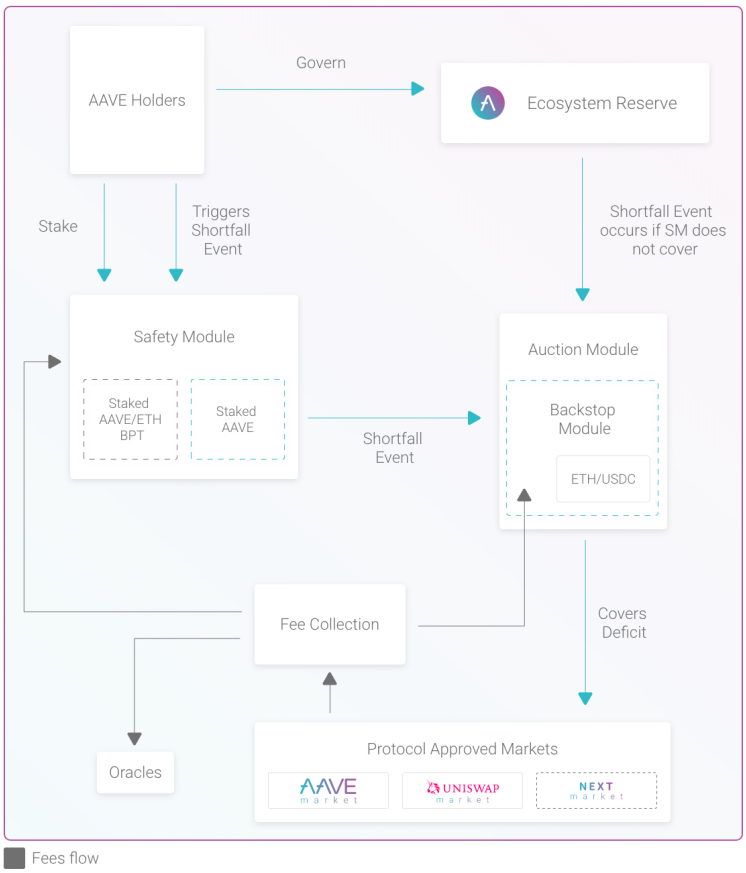

Aave tokenomics
Total Supply: 16,000,000 AAVE
Ecosystem Reserve
Safety Incentives (SI)
Ecosystem Incentives (EI)
Ecosystem Reserve received 3000 AAVE from the genesis supply.
distribute funds
AAVE market maker was built on top of AMM technology, so users can leverage their LP position on Uniswap and Balancer in the Aave Protocol
govern
Ecosystem Reserve incentivizes liquidity providers through token emission
Borrow/Lending rate is algorithmically set based on utilization
AAVE MARKET MAKER
BALANCER POOLS
UNISWAP POOLS
Lp tokens from Uniswap and Balancer can be used as colateral in the Aave Money Markets
AAVE MONEY MARKET
Lender & Borrower Pool
Liquidator
Flash Loan
Deposits
Borrow
User
Users receive Lp's for their pool position
Users receive an interest-bearing token
LP's tokens can be staked into the SM
User/ Hodl
Token Holders govern the Aave Money Market and the Ecosystem Reserve
Treasury
Treasury (Collector Contract)
0.09% fee
govern
stake & govern / receive reward
Liquidation will occur in case the Liquidation Threshold is Achievied, preventing default on loans.
Token Holders govern the Treasury and vote periodically to decide how to use the funds.
SAFETY MODULE (SM)
STAKED AAVE/ETH BPT
STAKED AAVE
The Safety Module is built on top of AMM technologies. Liquidity Pools are used to provide market depth to the Aave tokens and earning for locking Aave.
The Safety Module will slash up to 30% of its funds to stabilize Aave Money Markets during a period of high volatility. When the protocol faces the risk of running a deficit due to oracle failures, smart contract risk or liquidation risks.
The Safety Module receives tokens from the ecosystem reserve fund (SI) to pay a reward to token holders who stake their tokens. The % reward is decided by governance.
* Reserve Factor is % of the Borrower Interest plus the Flash Loan Fee (0.09%) which is add to the protocol treasury
The reserve factor varies from asset to asset.
START HERE
Lenders deposit a token into a pool and earn an interesting bearing token (ERC20).
These tokens accrue the fees borrowers pay and perhaps incentives from the protocol.
Also, lenders can use these tokens to leverage their position.
(Deposit ETH and earn aETH)
Aave tokens can be used in the Uniswap and Balancer pools to earn LPs. LPs can be used as collateral or staked into the SM.
Token holders decide the level of incentive provided by the ecosystem reserve to liquidity providers and to Stakers. Also token holders, govern the Treasury.
Protocol revenues are generated through the reserve factor and add to the treasury
Borrowers can take an over-collateralized loan or an under-collateralized Loan (Flashloan)
Protocol revenues are generated through the reserve factor and add to the treasury
Token Holders can stake their Aave tokens into the SM to earn rewards. SM funds will be used to protect Aave Money Market against market risks.

- **Governance and Decentralization:** Token holders have governance rights proportional to their token balance, allowing them to vote on important proposals such as:
    - Adjustments to risk parameters.
    - Token issuance from the ecosystem reserve fund.
    - Treasury fund allocation.

  The governance system empowers the community to make decisions about protocol development and upgrades. This includes the ability to submit and vote on Aave Improvement Proposals (AIPs), driving the evolution of the platform in a decentralized manner.

- **Staking and Safety Module:** Aave tokens can be staked in the **Safety Module (SM)**, designed to secure the protocol. This mechanism allows users to stake AAVE to earn rewards while also safeguarding the system against potential shortfall events, such as smart contract failures or liquidation risks. In the event of a shortfall, up to 30% of the staked tokens in the Safety Module can be used to stabilize the protocol. Rewards for staking are classified as **Safety Incentives (SI)**, and they are issued by the ecosystem reserve. The rate of these incentives is determined periodically by governance votes.
    - **Burning mechanism**: The concept of the **burning mechanism** refers to the process of reducing the total circulating supply of AAVE tokens by permanently removing them from circulation. This is typically done to increase the scarcity of the remaining tokens, which can have a deflationary effect, potentially increasing the value of the token over time.
      The burning mechanism in AAVE is closely linked to the **Aave Safety Module (SM)**, which serves as a decentralized insurance fund designed to protect the protocol in case of a shortfall event, such as bad debt.

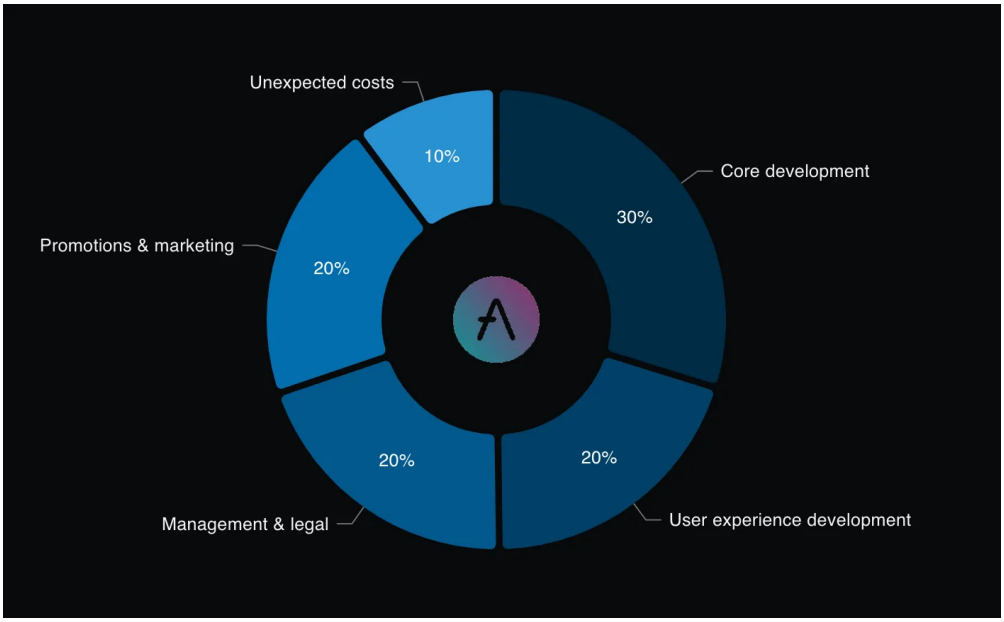
Safety Module Architecture




- **Liquidity and Economic Expansion:** Aave incentivizes liquidity providers by distributing AAVE tokens from its ecosystem reserve. The reserve was initially allocated 3 million AAVE tokens from the genesis supply to stimulate economic growth. To further attract liquidity, Aave integrates with **A**utomated Market Maker (AMM) technologies like Uniswap and Balancer, allowing users to use their LP tokens as collateral in Aave's lending markets.

- **Token Supply and Distribution:** Aave has a total supply of **16 million tokens**, with **14.9 million** currently circulating. Here, 2.1 million tokens are held in the ecosystem reserve. Aave's decentralized token distribution sets it apart from other projects. Unlike many other protocols, Aave has distributed its tokens widely, with no central entity or founding team holding a significant portion of the supply. This ensures a more democratic governance process and reduces the risk of centralization. The Safety Module is the largest holder of staked AAVE tokens, followed by the ecosystem reserve.

  *Initial token distribution:*




- **Incentive Mechanisms and Value Capture:** Aave generates revenue through:
  - **Interest rate spreads** between borrowing and lending.
  - **Flash loan fees**, where Aave charges 0.09% for these no-collateral, instant loans.

  These revenues are directed to the treasury, which is governed by AAVE token holders. The governance community decides how to allocate these funds, ensuring that the protocol's long-term growth is prioritized. Aave's token holders can influence decisions regarding risk parameters, liquidity mining programs, and other economic strategies.

  Although AAVE's utility as a staking token primarily offers governance rights and safety incentives, there is ongoing discussion in the community about expanding its use cases. Future possibilities include the use of AAVE as collateral in Layer 1 networks or as a gas asset in new blockchain ecosystems.

- **Aavenomics tempcheck proposal:** The AAVEnomics proposal, in its "[TEMP CHECK]" phase, outlines a comprehensive update to Aave's tokenomics aimed at enhancing the protocol's value capture and safety mechanisms. The proposal has several key points:
  - **Revenue Distribution and Buybacks**: Aave plans to distribute protocol revenue through buybacks of $AAVE tokens from the market, benefiting stakers by reducing sell pressure. This aligns the AAVE token more closely with the protocol's financial health.
  - **Safety Module Shift**: A significant change involves transitioning from the old Safety Module, where users staked $AAVE, to an "Umbrella" system. This new system

introduces voluntary user deposits through aToken modules, making it more flexible and tailored to specific risks.

- **GHO Staking Modifications**: The proposal redefines the GHO staking module, limiting it to covering bad debts associated with GHO liabilities and no longer across the whole protocol.
- **Phased Implementation**: The proposal's rollout will occur in three phases:
  - **Phase I**: Focuses on staking and GHO updates.
  - **Phase II**: Involves upgrading $AAVE token utility, stopping staking for GHO borrow rate discounts, and fully discontinuing the LEND-to-AAVE token swap.
  - **Phase III**: Activates the fee switch, initiating buybacks, and rewards for stakers.

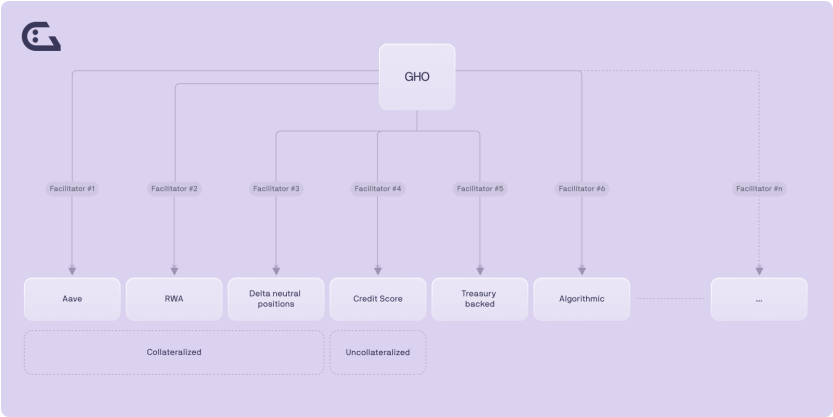
- **Importance:** This proposal is crucial because it introduces a direct mechanism for $AAVE token holders to benefit from the protocol's revenue, improving the token's value proposition. Additionally, it reduces inflationary pressure by discontinuing $AAVE emissions for staking rewards, making the token scarcer over time.
- Consequences if Approved:
  - **Increased Value Capture**: Aave's revenue will directly support $AAVE's market price through buybacks, benefiting long-term holders.
  - **Improved Protocol Security**: The new Umbrella system introduces greater flexibility and better risk management.
  - **Attracting New Investors**: The proposal's approach, especially in reducing sell pressure and increasing rewards for token holders, could draw more investors from both the crypto space and traditional finance.

  If the community approves this proposal, it could lead to a long-term positive impact on $AAVE's price and solidify Aave's position as a leading DeFi protocol

- **GHO Stablecoin:** GHO is a decentralized multi-collateral stablecoin that is fully backed, transparent and native to the Aave Protocol. As such, GHO is similar to Maker DAO's stablecoin: DAI. Indeed, both has a stability fee (borrow cost) which is 1.5% max for GHO and 3.5% for DAI.  As with all borrowing on the Aave Protocol, a user must supply collateral to be able to mint GHO. Correspondingly, when a user repays a borrow position (or is liquidated), the GHO is returned to the Aave pool and burned. All the interest payments accrued by minters of GHO will go directly to the Aave treasury.
  - **Why GHO ?**
    - Market demand: Based on the current state of the market, there is still a limited adoption of decentralized stablecoins and room for growth.

- Recent stablecoins FUD: during the last year , there have been several FUD on the biggest stablecoins such as USDC, USDT or BUSD. These events shown that the market is still uncertain about the robustness of these stablecoins. At the same time:
  - The Aave Protocol already has the infrastructure to support many of the features needed to implement a stablecoins.
  - GHO stablecoin will be directly implemented into DeFi ecosystem through Aave protocol.

- **How it works** ?
  - **Facilitators**: Can trustlessly mint and burn GHO tokens through various strategies. These strategies can be enacted by these Facilitators that may employ varying strategies for integrating GHO. But each Facilitator is validated by Aave DAO and linked to a "Bucket"with a specify capacity as follow:




Currently, there are only two entities which are Facilitators:

- Aave v3 Ethereum pool: has been proposed to the Aave DAO to serve as one of the initial Facilitators on the Ethereum Mainnet
  - take advantage of risk-reducing features of this version of the protocol.
- FlashMinter: helps to facilitate arbitrage, provide instant liquidity, and have the ability to liquidate users
  - keep health ratio sustainable.

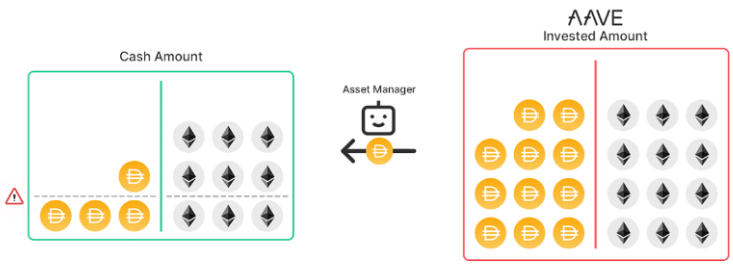
- **Governance**: it does not have a single concentrated point of control. Instead, GHO is controlled by Aave Governance and so, Aave Companies do not have any control over it.

        - Aave Governance has the right to determine GHO Facilitators and parameters and to propose changes to the current implementation.
    - **Floor price**: GHO has been hard coded to be equal to 1$. This mean that there will be arbitrage opportunities from spread in volatile market conditions.
    - **Collateral**: All assets that are enabled for use as collateral on the Aave Protocol can be used to back GHO.
    - **Liquidations**: If the value of users' collateral drops due to market conditions and their health factors decrease, liquidations can occur.
    - Now that we have described how GHO token is working, the second step is to discuss on advantages that this feature is bringing and potential drawbacks:
        - Advantages:
            - **Native token**: it's a stablecoin native to the Aave Protocol and controlled by Aave Governance, has the potential to make stablecoin borrowing on the Aave Protocol.
            - **Competitiveness**: provide more features for stablecoin users, and generate additional revenue for the Aave DAO by sending 100% of the interest payments accrued by minters of GHO directly to the Aave DAO Treasury.
            - **Censorship resistance and transparency:** No KYC or administrative documents to fulfill before minting the token.
            - **Multi-collateral Positions**: GHO is based on their entire set of supplied collateral assets across the Aave Protocol. This improve the robustness of the collateral behind the stablecoin.
            - **Store of value**: In difficult market conditions and in order to diversify stablecoin portfolio management, GHO is going to be a first choice for many DeFi users as it based its security on Aave protocol.
        - Drawbacks:
            - **Incentivazor**: Because GHO is not currently well implemented in DeFi, there is no interesting use cases. Thus, Aave hasn't other choice than incentivize with high yield for lender in the detriment of Aave holders (Aave token holders dilution)
            - **Internal competition**: Assuming GHO succeeds and so trades at par with USDC, why would anyone pay 2.5% to borrow USDC on Aave when they could simply mint GHO for 1.5%? At the end it means less liquidity inside Aave's pools.
            - **Security**: The last work from Sigma Prime about GHO's audit reports one high important issue. Indeed, audit flagged an issue where the code implementation didn't match the spec in the technical paper.

## Product & Ecosystem

- **Use Cases**: Aave V3 supports several critical use cases in decentralized finance:
  - **Lending**: Users can deposit assets into liquidity pools and earn interest from borrowers.
  - **Borrowing**: Borrowers can access liquidity by posting collateral and paying either variable or stable interest rates.
  - **Liquidity Provisioning**: Aave's liquidity pools allow users to provide capital to the platform in return for yield, ensuring the platform has sufficient liquidity to support borrowing.
  - **Flash Loans**: These **uncollateralized loans**, which need to be repaid within the same block, remain a unique feature of Aave and are used for arbitrage, liquidation prevention, and debt refinancing.

- **Partnerships and Integrations**: Aave's strategic partnerships and integrations continue to expand its influence within the DeFi space:
  - **Balancer v2 asset manager**: It was the first partnership to be announced linked with Aave. The Aave-Balancer Asset Manager optimizes liquidity utilization in AMMs by routing idle tokens from Balancer V2 pools to Aave for additional yield. It ensures that the pool has sufficient cash amounts of tokens to prevent failed trades, and it maximizes yield by investing in tokens with increasing abundance. Replenishment is incentivized and carefully managed to minimize gas costs, making it more efficient than current solutions.

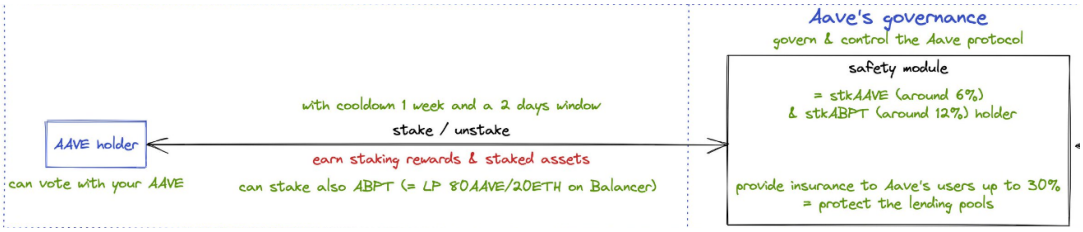



The Aave-Balancer Asset Manager replenishes the cash amount of DAI in Balancer's vault to prevent trades from failing and invests more WETH in Aave to maximize yield

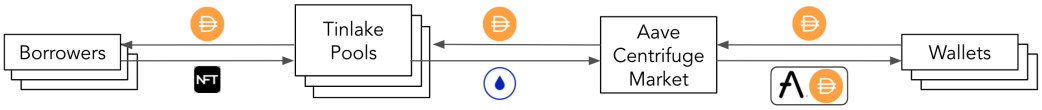
The collaboration between Aave and Balancer aims to **create a gas-efficient method for LPs to earn additional yield** without added swap costs, and other projects can integrate their own Asset Managers into the V2 ecosystem.

- Safety module: To be even more closer to Balancer protocol, Aave create a token called “ABPT” which is a liquidity providing token composed at 80% of Aave token and at 20% of Ethereum token from Balancer. By providing and stacking this LP token as “stkABPT” to Safety Module, users earn rewards from protocol fees from the risk taken to refund Aave’s users in case of hack.

  Of course, this LP takes advantages of the first feature present just above to optimize yield on “ABPT”.




- **Centrifuge:**
  - Bridge: Announced at the end of 2021, Aave were proud to built with Centrifuge the RWA Market bridges in DeFi ecosystem with the limitless potential of real-world assets. This bridge is composed by 7 Tinlake Pools and transactions have to be in DAI:




  As such, the Aave-Centrifuge partnership favors both lenders and borrowers. While Aave users were formerly limited to investing in cryptocurrencies, the RWA Market will open opportunities to earn yields from real-world assets uncorrelated with the crypto market. At the same time, Centrifuge users will be able to access a new source of liquidity using their DROP tokens as collateral to borrow from the RWA Market.

  Find the full description of the partnership in the proposal.

- **Sky**:
  - Aave and Sky (previously known as Maker) are collaborating to bridge the gap between Decentralized Finance (DeFi) and Traditional Finance (TradFi), following a governance proposal by Phoenix Labs on September 2. The collaboration is called the "Sky Aave Force."

- The proposal suggests issuing SPK tokens, native to Sky's subDAO, Spark, to establish a market for USDS, a stablecoin launched after Maker's rebranding. The aim is to foster cooperation and promote the mass adoption of DeFi through this initiative.
- Phoenix Labs proposed distributing 3.33 million SPK tokens per month to incentivize an Aave v3 market for Sky's sUSDS, a yield-bearing token tied to the Sky Savings Rate (SSR) program. Idle sUSDS deposited in Aave would consistently earn SSR, potentially outperforming USDC and USDT.
- A key part of the proposal is the introduction of a USDS Direct Deposit Module (D3M) in Aave's Lido Market with a $100 million debt ceiling. This would allow Sky to mint USDS directly into Aave's market without collateral requirements, similar to Aave's existing partnership with Lido.
- Aave, as the largest DeFi lending market with over $11 billion in Total Value Locked (TVL), presents strong synergies for USDS, which could become the largest decentralized stablecoin. Phoenix Labs views this partnership as the beginning of a deeper relationship between Aave and Sky, positioning both protocols as central to scalable DeFi.


- **BlackRock:**
  - Technical Aspects of the Partnership:
    - Aave proposes to onboard BlackRock's USD Institutional Digital Liquidity Fund (BUIDL) as collateral for its stablecoin, GHO. BUIDL shares would be added to the GHO Stability Module (GSM), allowing users to exchange GHO one-to-one with supported assets, enhancing yield generation while maintaining a stable peg to the U.S. dollar.
    - The integration would allow BUIDL shares in GSM to generate yield from real-world assets (RWAs), with dividends accumulating in BUIDL and fees from swaps

accruing as GHO.

- Benefits for Aave:
  - By integrating BUIDL, Aave expands yield sources, making its collateral pool more diversified and potentially more lucrative, enhancing returns for users of its stablecoin, GHO.
  - Adding a real-world asset like BUIDL provides greater stability and reliability to GHO's backing, reinforcing trust in Aave's decentralized ecosystem.
  - Collaborating with BlackRock, a global financial powerhouse, positions Aave to access more real-world assets, bridging the gap between traditional finance and DeFi.
  - The partnership helps Aave tap into a growing trend of tokenized real-world assets, driving further adoption of decentralized finance by integrating traditional assets into the DeFi space.

## Risks & Challenges

- **Security Risks:**
  Aave, as a decentralized finance protocol, faces inherent risks associated with smart contract vulnerabilities. Despite the robust nature of Aave's code, vulnerabilities can still be exploited by malicious actors, particularly through the use of flash loans, which have historically been abused for manipulating price oracles or draining liquidity pools. However, Aave mitigates these risks by regularly undergoing comprehensive security audits. The V3 iteration of Aave introduced several improvements to enhance security and operational efficiency, such as Efficiency Mode (eMode) and Isolation Mode, which limit exposure to certain assets in risky situations.
  - **Safety Module (SM):** This module is Aave's primary defense mechanism against liquidity shortfalls. Users are incentivized to stake their AAVE tokens or ABPT (Balancer Pool Tokens) in the module, with a lock-up period of 20 days. Should a Shortfall Event (SE) occur, such as a significant smart contract exploit or malfunction in price oracles, the staked tokens are auctioned to cover the deficit. This approach not only provides a safety net but also distributes risk among the stakeholders. Aave also has a Backstop Module, which allows it to mint and auction AAVE tokens as a last resort to cover shortfalls.
  - **Regular Audits and Bug Bounties:** Aave's contracts have been regularly audited by industry-leading firms, which have played a pivotal role in identifying and addressing potential security gaps before they can be exploited. The protocol also implements a bug bounty program, encouraging external developers to report vulnerabilities.

- **List of Audits done on AAVE:**

| Audit Firm | Date | Version | Key Areas Audited | Findings | Severity of Issues |
|---|---|---|---|---|---|
| Trail of Bits | January 2020 | Aave V1 | Initial protocol launch security | Minor vulnerabilities, all resolved pre-launch | No critical issues |
| OpenZeppelin | November 2020 | Aave V2 | Flash loans, credit delegation, core functionalities | Medium- and low-severity issues, all resolved before deployment | No critical issues |
| Certora | March 2022 | Aave V3 | Formal verification, cross-chain functionality, isolated pools | No critical vulnerabilities, minor issues fixed before deployment | No critical issues |
| Sigma Prime | February 2023 | GHO Stablecoin | GHO stablecoin minting, burning, and smart contract security | One high-severity issue related to code mismatch with spec, resolved before feature went live | One high-severity issue, resolved |
| PeckShield | Ongoing | Continuous Monitoring | On-chain behavior and protocol monitoring | No severe issues reported, continuous monitoring for anomalies | No critical issues identified during monitoring |
| Quantstamp | 2022 | Aave V3 | eMode, flash loans, cross-chain features | Medium-risk inefficiencies, all resolved before deployment | No critical issues |
| ABDK Consulting | 2022 | Aave V3 | Cross-chain liquidity management, isolated markets | Moderate-risk issue related to cross-chain liquidity, addressed before V3 upgrade | One moderate-risk issue, resolved |

- **Regulatory Risks:**
  As DeFi becomes increasingly integrated with traditional financial systems, protocols like Aave are subject to growing regulatory scrutiny. Jurisdictions worldwide are contemplating the regulatory status of decentralized protocols, particularly concerning Know Your Customer (KYC) and Anti-Money Laundering (AML) regulations. Aave has started taking steps towards compliance without compromising decentralization,
  such as introducing KYC-compliant permissioned pools for institutional users, allowing regulated entities to interact with the platform in a secure and compliant manner.

- **Risk Management Mechanisms:**
  Aave has established multiple mechanisms to manage risks:
  - **Health Factor and Liquidation Mechanism:** The protocol utilizes the Health Factor to determine the risk of liquidation for each borrower. If the Health Factor drops below 1 due to volatile price movements in collateral, anyone can trigger the LiquidationCall() function, earning a bonus for liquidating the undercollateralized position. This decentralized liquidation process helps maintain the solvency of the platform.
  - **Collateral and Borrowing Caps:** To mitigate risks associated with volatile assets, Aave sets borrowing and supply caps on each asset. This ensures that the protocol does not become overexposed to any single token, preventing systemic risks.
  - **Major actor in risk simulation Gauntlet has left Aave ecosystem:**
    - Gauntlet has worked to make DeFi safer and more efficient, serving as an independent risk manager for Aave since 2020. Gauntlet provided monitoring, analysis, and parameter recommendations to Aave, with most of their 60-person team contributing to this work.
    - Gauntlet is ending its collaboration with Aave, stopping its payment stream and seeking a replacement for the Risk Steward role.
    - **Challenges Faced:**
      - Difficulty navigating **inconsistent guidelines** and **unwritten objectives** from Aave's largest stakeholders.
      - Issues with duplicate proposals (e.g., TUSD offboarding).
      - Criticism over the distribution of **ARB emissions** to Aave users.
      - Accusations of "moonlighting" when Gauntlet’s research team worked on economic audits for Aave forks like Chaos.

- **Future Outlook:**

With its V4 update and upcoming innovations such as the Unified Liquidity Layer and enhanced Account Abstraction features, Aave is positioning itself as a pivotal player in the DeFi ecosystem. The introduction of GHO, Aave's native stablecoin, provides a new revenue stream and aligns incentives between the protocol and its users. These developments, alongside Aave's commitment to security and regulatory readiness, make it well-equipped to handle future challenges.

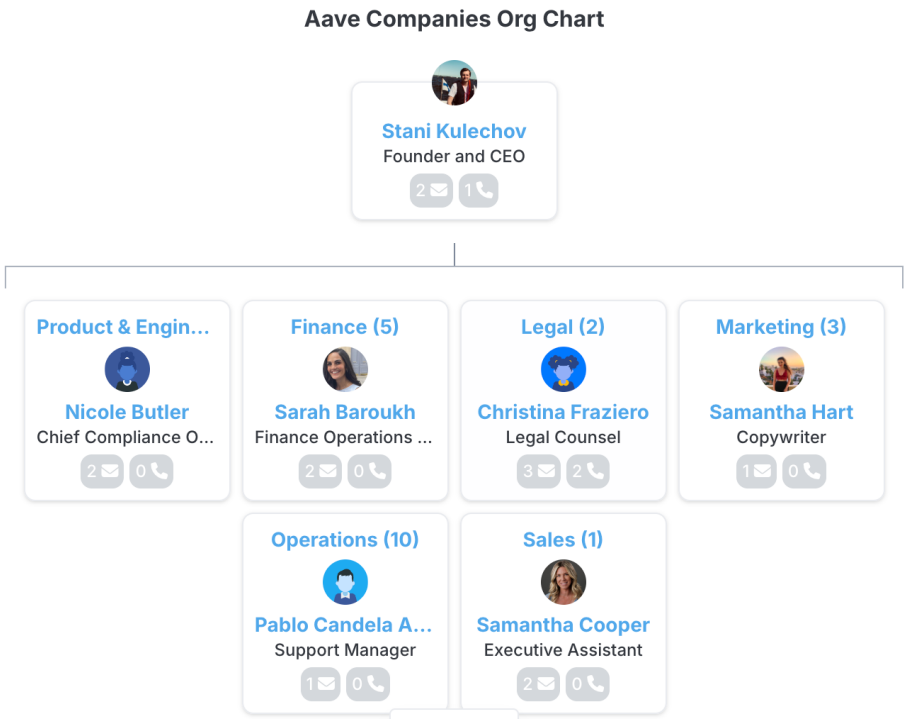
Value Creation / Traction

## Current Maker datas

- Date: 19/09/2024
- Price: 147.65$
- Current Token Value Locked: 11,557,481,388$
- Current circulating marketcap: 2,203,625,878$
- Current fully diluted marketcap: 2,203,625,878$
- Cumulative fees generated by AAVE over the last 365d: 357,502,000$

***Market traction study***

Team / Community




- **Aave's Team and Innovation:** Aave's core team, led by its founder **Stani Kulechov**, has a strong background in DeFi innovation. Stani, who holds a master's degree in law, founded Aave in 2017 with the goal of creating decentralized money markets. The team has played a pioneering role in introducing groundbreaking features like **flash loans**, which allow users to borrow large sums without collateral, provided the loan is repaid within the same transaction. This feature revolutionized DeFi, offering use cases such as arbitrage, collateral swaps, and liquidation prevention. It has also inspired the development of similar features across other DeFi platforms.

- **Active Participation**: The Aave community is known for being highly active in governance proposals and discussions. Aave's community on platforms like the Aave Governance Forum, Discord, and social media channels is full of engaged users and developers who actively discuss and vote on protocol improvements. This engagement signals a high level of trust in Aave's vision and promotes a collaborative development process.

| Name | Proposals | Successul Proposals | Proposals in the last 30 days | Successfull Proposals in the last 30 days |
|---|---|---|---|---|
| AAVE | 687 | 647 | 13 | 9 |
| AAVEgotchi | 521 | 422 | 8 | 3 |

- Key to this governance process is the distribution of **proposal power** and **voting power** to token holders. This allows users to either directly participate in governance or delegate their voting rights to others. Critical protocol changes, including risk parameter updates or asset listings, undergo rigorous community discussions and voting before being implemented, ensuring that decisions reflect the consensus of Aave's broad community.

- Aave's governance also ensures that **institutional partners** can participate in a compliant manner through **KYC-compliant permissioned pools**. These pools cater to regulated institutions, allowing them to provide liquidity or borrow in a secure and compliant environment, without compromising the decentralized ethos of the protocol. This blend of open participation and institutional inclusion strengthens Aave's governance framework.

## Roadmap

- **Aave 2030 Roadmap Overview:** The Aave 2030 roadmap outlines a series of innovative solutions designed to solidify Aave's leadership in decentralized finance (DeFi). It builds upon existing technologies like Aave V3 and GHO stablecoin, aiming to scale the Aave ecosystem and DeFi for a broader user base, potentially reaching billions. The roadmap emphasizes continuous innovation and community collaboration over the next several years.

- **Key Components of the Aave 2030 Roadmap:**

    - **New Aave Visual Identity:** Aave will undergo a visual rebranding to align with its future goals. This updated visual identity will make the protocol more recognizable in the DeFi space and reinforce brand loyalty. The new identity will be licensed to the Aave DAO, ensuring community ownership and governance of the brand. This branding update aims to position Aave as a modern and forward-thinking entity in the broader financial ecosystem.

    - **Aave V4 – The Next Generation of Aave:** Aave V4 is a cornerstone of the 2030 roadmap. This new iteration of the protocol will introduce significant technological advancements, positioning Aave at the forefront of the DeFi space. V4 will integrate more sophisticated features to improve liquidity and offer a seamless user experience across multiple blockchains. The full details of Aave V4 will be discussed with the community to refine and enhance the proposal.

- **Cross-Chain Liquidity Layer (CCLL):** Aave plans to enhance its cross-chain liquidity capabilities with the development of a Unified Liquidity Layer. This feature builds on the Portals introduced in Aave V3, which allowed for borderless liquidity. Leveraging new technologies like the Cross-Chain Interoperability Protocol (CCIP) and superchains, Aave's liquidity system will allow users to borrow and access liquidity instantly across multiple supported networks. This innovation will also serve as a new revenue source for the protocol.

- **Real World Assets (RWAs) and GHO:** The roadmap emphasizes expanding Aave's influence into Real World Assets (RWAs). Aave's GHO stablecoin will play a crucial role in integrating RWAs into the DeFi ecosystem, creating new products that blend traditional finance with decentralized technologies. Aave Labs is working with partners, including Chainlink, to develop the necessary infrastructure for RWAs, which will further solidify GHO's position in the market and grow its adoption.

- **Aave Network:** Aave will introduce its own network to serve as the central hub for Aave and GHO. While remaining multi-chain and network-agnostic, the Aave Network will serve critical functions such as lowering the cost of accessing the Safety Module, facilitating Aave's governance through Governance V3, and acting as the primary cross-chain hub for liquidity. The network will feature enhanced security through Ethereum integration and leverage account abstraction to improve the user experience.

- **Expanding to Non-EVM Chains:** As non-Ethereum Virtual Machine (non-EVM) chains gain popularity, Aave plans to expand its ecosystem to these networks. While Ethereum remains Aave's home base, expanding to non-EVM chains is a critical part of Aave's strategy to capture a larger market share and reach new users.

- **New DeFi Products:** Aave Labs is also developing new DeFi products that will complement the existing ecosystem. These products, though independent from the core Aave Protocol, will be designed to drive further growth for Aave and GHO. Details on these products will be shared with the community when ready.

- **Funding and Grant Structure:** The roadmap is structured over a three-year grant period, with an annual review and renewal process. Aave Labs is requesting a grant of 15 million GHO and 25,000 stkAAVE for the first year to cover research, development,

technical resources, and audits. This proactive funding model ensures transparency and alignment between Aave Labs and the DAO.

- **Community Involvement and Governance:** A key theme in the roadmap is community participation. Aave Labs emphasizes that its role is that of a technical contributor, with all major decisions made by the Aave DAO. The roadmap encourages active collaboration between Aave Labs, other contributors, and the broader community. Regular feedback will be sought to ensure that all initiatives align with the goals of the Aave DAO.

- **AAVE V4 Proposal in Details:** The AAVE V4 proposal introduces a significant evolution in AAVE's decentralized finance (DeFi) infrastructure, building upon the success of AAVE V3. It aims to enhance capital efficiency, reduce governance overhead, and integrate the AAVE-native stablecoin, GHO, into the protocol. The proposed timeline extends from Q2 2024 to a full release by mid-2025, with active community involvement throughout the process.
  Key features of AAVE V4 include:
  - **Unified Liquidity Layer:** AAVE V4 introduces a new Unified Liquidity Layer, generalizing the concept of portals from V3 to create a flexible liquidity provisioning infrastructure. This layer will allow onboarding new borrowing modules without migrating liquidity, thereby eliminating fragmented liquidity and improving system efficiency.
  - **Fuzzy-Controlled Interest Rates:** Interest rates will now be dynamically adjusted based on market conditions, reducing governance overhead. By using fuzzy logic, the kink point and base rates will be modified automatically to optimize capital efficiency for both suppliers and borrowers.
  - **Liquidity Premiums:** V4 will introduce adjusted borrowing costs based on collateral risk factors. The protocol will assign risk factors (ranging from 0 to 1) to collateral, dynamically adjusting borrowing costs according to the collateral composition's risk. This improves capital efficiency and makes borrowing with lower-risk assets more attractive.
  - **Smart Accounts and Vaults:** AAVE V4 introduces Smart Accounts, enabling users to manage multiple positions from a single wallet. Additionally, the protocol will introduce Vaults, allowing users to borrow without supplying collateral directly to the liquidity

layer. The collateral will instead be stored within the Smart Account, further segregating risks and improving the user experience.

- **Dynamic Risk Configuration and Asset Offboarding:** V4 introduces a dynamic risk configuration mechanism, allowing changes to liquidation thresholds without disrupting existing users. This reduces governance complexity while maintaining optimal risk management. Automated asset offboarding will further streamline governance, progressively reducing liquidation thresholds until the asset is offboarded.

- **Automated Treasury Management and Liquidation Engine V4:** AAVE V4 automates treasury management, enabling the protocol to sell collected reserve assets to pre-configured tokens. It also introduces improvements to the liquidation engine, such as a variable liquidation factor, reverse auctions for liquidation bonuses, and multiple parallel liquidations.

- **Stronger GHO Integration:** The proposal integrates GHO more natively into the AAVE protocol, allowing for GHO soft liquidations, native GHO minting, and interest paid in GHO. These changes aim to improve liquidity and make GHO more attractive as a stablecoin within the ecosystem.