



COSMIC HORIZON

IN-GAME ECONOMICS

Cosmic Horizon

In-Game Economics

Economics of Cosmic Horizon

Updated December 2022

QWOYN blockchain economics are structured to have a degree of malleability, in order to better serve the in-game economy of Cosmic Horizon and future games or projects as they are deployed. The tokenomics outlined in this document will be adjusted subject to the outcome of playable testnets that precede mainnet launch of the game. However, core concepts will carry over.

Portions of the in-game economy of Cosmic Horizon are inherently self-sustaining (such as those outlined in section 3.1 of this document) while others require a degree of automated management performed by custom modules. These “active intervention” modules subsidize the game mechanisms that provide the $COHO players earn during the course of play. Through such measured economic intervention the wheels of trade are kept in motion and player behavior beneficial to gameplay is incentivized.

This document details the various tools and methods used to enable a balanced in-game economy; incentivize desired gaming behaviors; and enable a truly sovereign, fun, and engaging play-and-earn gaming experience.

Table of Contents

1 Cosmic Horizon Token $COHO and Commodities **1**

2 Genesis **2**

2.1 Private Liquidity Pool ($QWOYN/$COHO) **3**

2.2 Outpost Bankrolls at Mint 3

2.3 Stimulus Module 4

3 Player $COHO Accrual: Trading/Outposts, Banking, Planetary Banking **4**

3.1 Transfer Accrual Methods 4

3.2 Standard Accrual Methods 5

4 Active Intervention and Liquidity Pool Utility **6**

4.1 CoHo Stimulus Module 6

4.2 $QWOYN/$COHO Private LP **7**

4.3 Primary (Public) LP trading pair **7**

4.4 Outpost replenishment mechanism **8**

4.4.1 Outposts buying commodities 8

4.4.2 Outposts selling commodities 10

4.5 Interest Deposits 11

4.5.1 The StarMall Bank aka Bank of Galactica 11

4.5.2 Planetary Banking 11

5 Special Missions / Quest Rewards **12**

6 The Invisible Hand and $QWOYN Sustainability **12**

1 Cosmic Horizon Token $COHO and Commodities

$COHO is a minted bank token of the Qwoyn blockchain and serves as the in-game currency of Cosmic Horizon. The in-game token is quasi-inflationary, with an inflation rate projected to be in the range of 1% and 20%, though the ultimate figure will be based upon the game requirements, as determined through player behavior during beta testing and potentially adjusted as necessary after the official launch. We refer to $COHO as quasi-inflationary, as additional tokens will be minted at a given inflation rate and distributed to the Stimulus Module (see 4.1, CoHo Stimulus Module) on an epoch by epoch basis.

$COHO will be available exclusively via the private $QWOYN/$COHO liquidity pool (LP), which transfers acquired $COHO to the *game manager module* (GMM), where the funds are made available to the player's avatar. In order to bring funds into Cosmic Horizon, a player must first acquire $QWOYN and exchange them for $COHO via this LP.

Commodities are tradeable goods that exist exclusively within the Cosmic Horizon universe. Players may buy and sell commodities from trading outposts[1] that exists across the CoHo universe. Each outpost has an inventory of the commodities it is selling and a bankroll for each commodity it is buying.

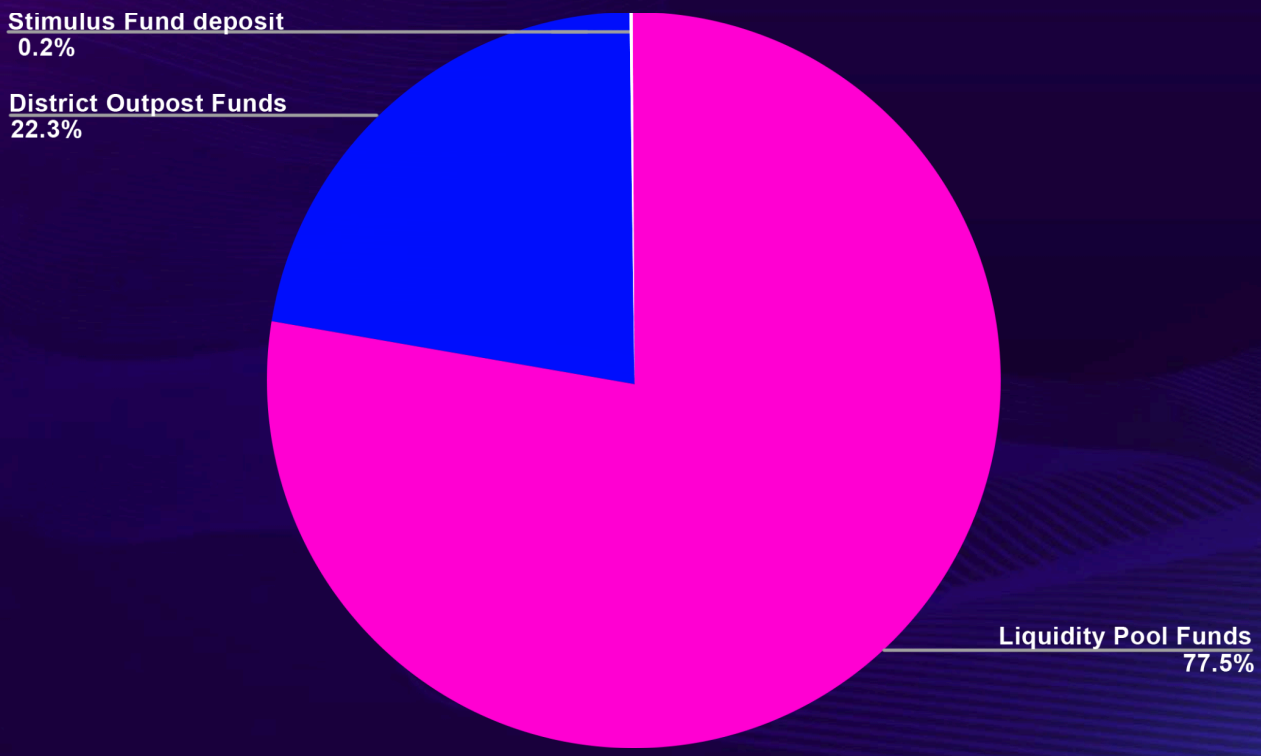
Players earn $COHO in a variety of ways, but chief among them is performing *celestial arbitrage* between outposts: i.e. purchasing commodities from one outpost (or collecting them from a developed planet) and selling them to another for a profit. Players can also earn interest on $COHO they have acquired by depositing it into either a StarMall- or planetary bank.

Most other methods of $COHO accrual can be classified as *transfers* rather than earnings: i.e. collecting bounties others have posted or tolls from *toll drones*[2] that the player has deployed. These methods of $COHO accrual do not require economic management.

[1] Commodities are also created by developed planets. For more information on commodities, see the Cosmic Horizon white paper.
[2] See Cosmic Horizon White Paper, section 3.3.5.7 (Star Mall, General store, Drones)

2 Genesis

The total genesis mint of $COHO will be covered in detail in a later revision of this document, as many variables that affect it will be determined during the course of beta testing. The total mint can be generalized by discussing the game components that require tokens at genesis.



$COHO Genesis mint: LP mint (500M $COHO), 14.4M total deposit in outpost bankrolls, 100k nominal deposit into Stimulus Module

Using some abstractions we can describe the conditions of the genesis mint and reach an approximate minimum. Starting with a tentative initial $QWOYN/$COHO exchange rate of 1:1000 respectively, the genesis mint of $COHO tokens should be an approximate minimum of 500M $COHO in the $QWOYN/$COHO private liquidity pool and an additional 14.4M funding the District 1 Outposts, for an approximate total of 514.4M $COHO.

2.1 Private Liquidity Pool ($QWOYN/$COHO)

A significant portion of the genesis mint, along with 500,000 $QWOYN tokens from the liquidity bootstrapping pool, will be utilized to create a private LP featuring a $QWOYN/$COHO trading pair, which will feature an pool ratio of $QWOYN 500k / $COHO 5M (or 1:1000 respectively).

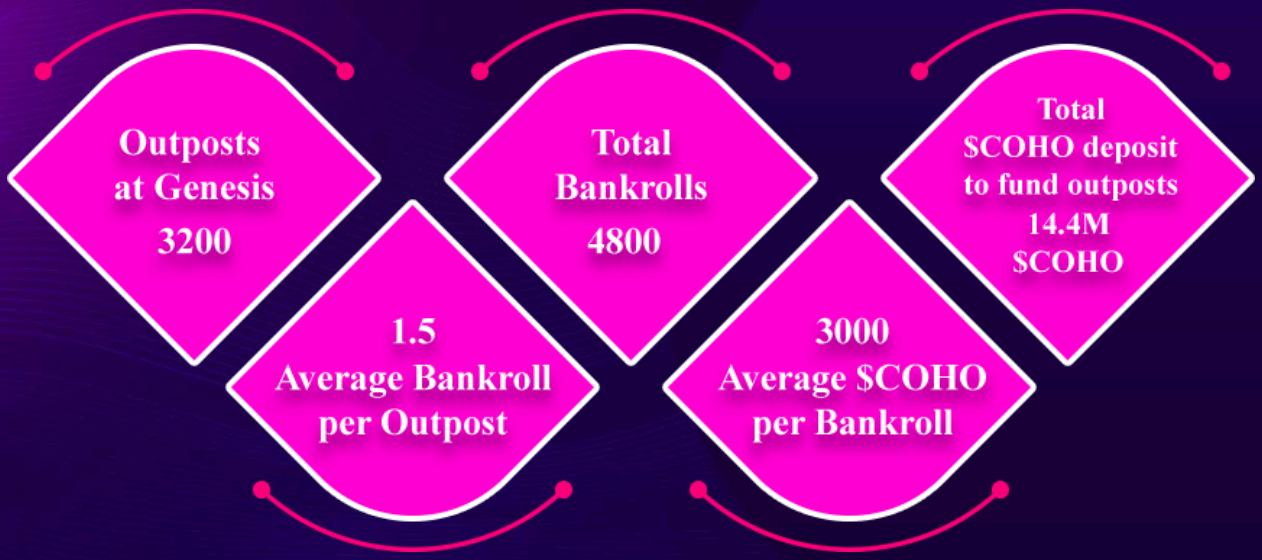
2.2 Outpost Bankrolls at Mint

All outposts that purchase commodities require one bankroll for each commodity they are purchasing. Conversely, outposts exclusively selling commodities require no bankrolls. A bankroll is essentially an individual wallet connected to the commodity the outpost is purchasing. The average number of bankrolls per outpost (with all outposts-types considered) is approximately 1.5 bankrolls per outpost. In the Cosmic Horizon universe, roughly 32% of sectors feature an outpost.

Using a soft estimate of the starting size of the CoHo universe, the number of starting bankrolls may also be calculated. The tentative projected max player set is 30,000 players and the projected universe size to accommodate that set is 300,000 sectors. The Cosmic Horizon Universe is created in *districts* that overlap slightly with one another, with each district accommodating 100 players. Though the actual mechanism is more nuanced, generally once a given threshold of players have entered the first district, some new players that join the game will begin in a new district . This will continue, with some player distribution variance, until all districts are generated and the max player count is reached. Players are largely free to travel from one district to another as new districts are generated.

Therefore, in the initial district there will be a projected 100,000 sectors and roughly 3,200 outposts with a total of approximately 4,800 bankrolls total. As new districts are generated, so too will new outposts, and the funds for their bankrolls will be minted. Variation exists between outposts, but for simplicity we will use an average maximum starting bankroll of 3000 $COHO.

District 1 Outposts at Genesis



From here we can extrapolate that the genesis mint to fund District 1 outposts, and by extension their bankrolls, will be 14.4M $COHO.

It is worth noting that a player arbitraging between two outposts will not typically be able to drain the bankroll of the outpost entirely. With each purchase and sale of commodities, the prices will increase and decrease respectively, diminishing the efficiency of each arbitrage. Though it is possible to drain an outpost's funds entirely, players will logically move on to more lucrative opportunities when an outpost's bankroll becomes partially depleted.

2.3 Stimulus Module

A nominal sum of 100,000 $COHO will be deposited into the Stimulus Module at genesis. Further funding will come from the other mechanisms outlined below (see 4.1 CoHo Stimulus Module).

3 Player $COHO Accrual: Trading/Outposts, Banking, Planetary Banking

3.1 Transfer Accrual Methods

Players are free to sell NFTs such as ships, artifacts, or other tradeable items on a marketplace. The price for these assets is governed by supply and demand and can be categorized as *transfers*.

Other examples of $COHO *transfer accrual / asset transfer accrual* include, but are not limited to, the following:

a) Players may attack other ships to seize their cargo or $COHO.
b) Players may post toll drones and keep the tolls that their drones collect
c) Players may collect bounties for destroying ships or players that have bounties on them

There is no economic intervention or management required for this portion of economics, besides providing a platform or sufficient interoperability with other platforms to enable such transactions.

3.2 Standard Accrual Methods

Standard $COHO accrual is accomplished through the following methods:

- Buying commodities from an outpost and selling them to another outpost for a profit (i.e. performing *celestial arbitrage*)
- Developing planets and selling the commodities they produce to outposts
- Earning interest on $COHO deposited in StarMall bank accounts
- Earning interest on funds deposited into planetary bank accounts

In order for standard $COHO accrual methods to be sustainable, some economic intervention is necessary, though the *degree of monetary intervention* is mitigated by player behavior incentives and standard game dynamics.

For example, new players can begin their in-game journey by profitably arbitraging commodities, thereby earning $COHO. They are free to extract this $COHO from the game via the LP exchange it for $QWOYN, but their arbitrage efficiency is constrained by the fuel economy and cargo capacity of the beginner ships. Such ships are also more vulnerable to attack from other players or damage from hazards. Thus player

behavior—spending $COHO on new ships and upgrading them—is incentivized by enhanced arbitrage opportunities. A portion of funds players spend on such upgrades may also be diverted, if necessary, to further stimulate the in-game economy.

Thus, depending on the player's disposition, they may:

- Spend the $COHO they accrue to improve their gaming experience with upgrades, bonus items, etc.
- Spend a portion of their $COHO on enhancing their experience but withdraw a portion because they enjoy tangible monetary reward
- Withdraw all their $COHO after each session though, as outlined above, the funds they extract are limited if they do not reinvest to a certain degree to enhance trading efficiency

The Cosmic Horizon economy is designed to be sustainable with any number of combinations of different player styles, but specifically intended to incentivize the first two categories of player.

4 Active Intervention and Liquidity Pool Utility

4.1 CoHo Stimulus Module

A portion of $QWOYN inflationary rewards and $COHO inflationary funds are paid into the Stimulus Module, which distributes funds in the form of interest deposits to players who have tokens in a StarMall- or planetary bank. The Stimulus Module also replenishes the bankrolls of outposts that purchase commodities. Depending on the needs of the in-game economy, the module may exchange $QWOYN for $COHO and burn these tokens, if the LP requires rebalancing.

Sources of $COHO paid to the Stimulus Module:

- A portion of $QWOYN inflationary rewards pass through $QWOYN/$COHO LP and are deposited into the Stimulus Module.
- All $COHO inflation is similarly transferred to the Stimulus Module
- All $COHO earned from outposts selling commodities are deposited into the Stimulus Module

Utilization of the funds in the Stimulus Module:

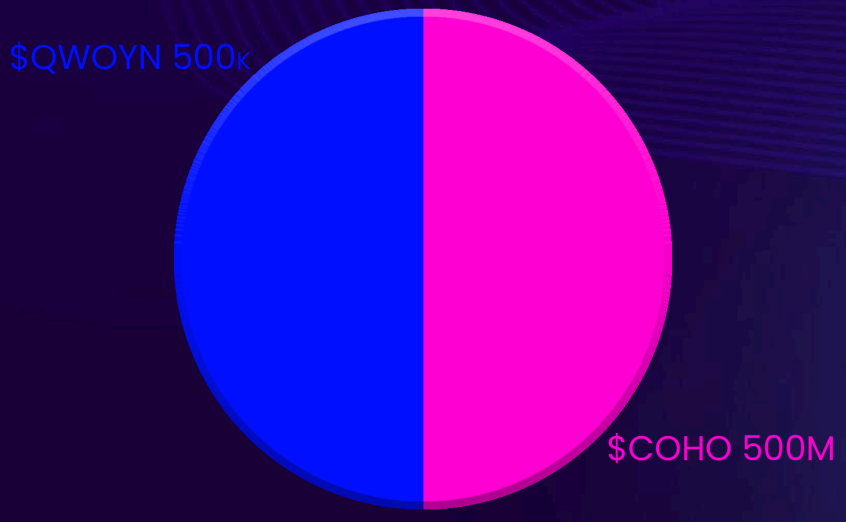
- At each epoch outpost bankrolls are partially replenished, unless they are already full (this increases the price paid to players for commodities)
- At each epoch outpost commodities are partially replenished (reducing cost of commodities to players)
- Interest deposits are paid to StarMall bank deposits
- Interest deposits are paid to Planetary bank deposits

Result of stimulus:

- Profitable arbitrage opportunities are maintained
- Player behavior is incentivized: *investing in better hardware* to trade more efficiently and *encouraging players to keep funds in-game* (to earn StarMall- or planetary banking interest deposits).

4.2 $QWOYN/$COHO Private LP

The large $QWONY/$COHO LP mitigates potential imbalance that could otherwise occur if too much of either token were to travel in one direction. The $QWOYN/$COHO private LP is designed to absorb even significant shifts without significantly impacting the in-game cost of goods. As a result, $COHO inflation provides the benefits outlined above, while the price impacts on either token are mitigated.



Initial $QWOYN / $COHO private liquidity pool trading pair

4.3 Primary (Public) LP trading pair

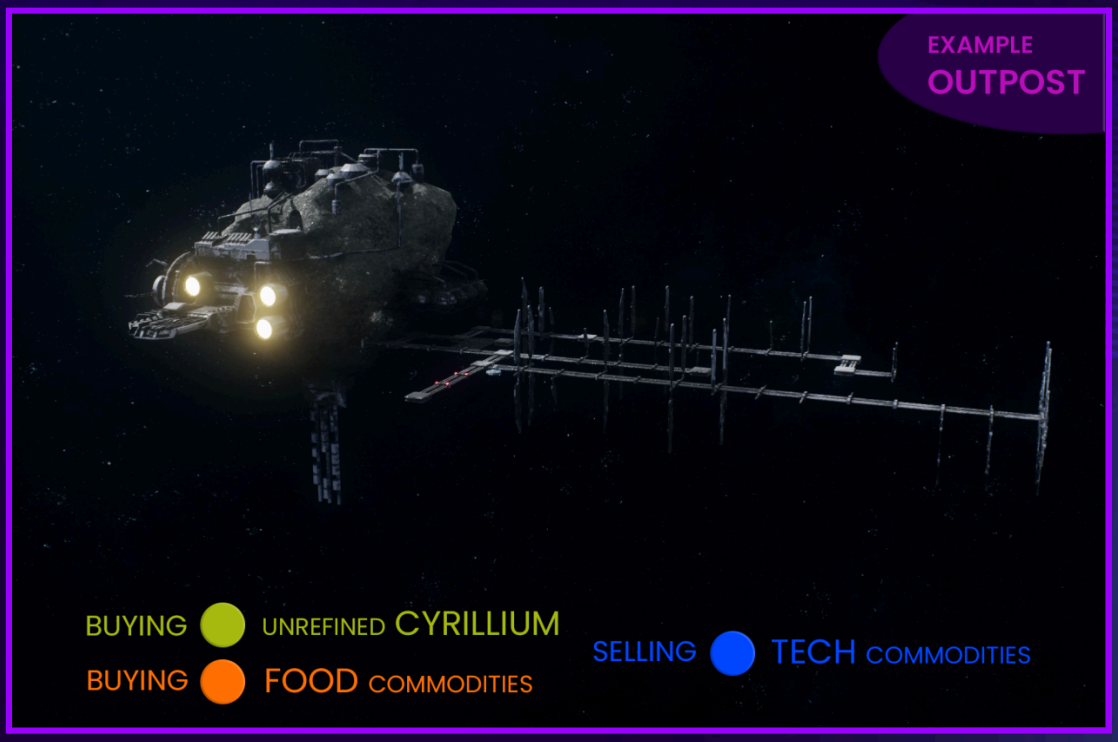
No coin or token is immune to price fluctuations, but relying on a $QWOYN/STABLECOIN[3] trading pair for its primary public liquidity pool is intended to help mitigate the impact of market volatility on $QWOYN tokens. This will more closely align the $QWOYN blockchain value with its utility and usage, rather than speculative trading or the overall performance of other Cosmos ecosystem chains. For more information on the Qwoyn blockchain economics document.

4.4 Outpost replenishment mechanism

For the sake of clarity, we will describe outposts selling and buying commodities separately, although the principles discussed apply similarly to either category. It is worth noting that outposts will initially be buying or selling a combination of three different commodities (*unrefined cyrillium*, *food commodities*, and *tech commodities*), though the variety of available commodities and resources will increase in later iterations of Cosmic Horizon.

4.4.1 Outposts buying commodities

An outpost buying one or more commodities has a discrete bankroll for each commodity it sells (a bankroll can be thought of as an individual wallet belonging to the outpost).



[3] Such as $USDC

An outpost does not require a bankroll for commodities it is selling. The price an outpost pays for a commodity is roughly proportional to its remaining bankroll, and each outpost has a set maximum bankroll for each commodity it is selling.

Let us imagine that an outpost is selling only tech commodities, and therefore has one bankroll. In this scenario, the outpost has a maximum bankroll of 1000 $COHO and it starts fully funded (i.e. 1000/1000 total possible $COHO in its single bankroll).

Scenario A:

Player A visits this outpost and sells 1 unit (i.e. one cargo hold) of *tech commodities* (TECH) to the outpost. In this scenario, the outpost will pay the maximum possible amount for the single unit of this commodity. For the purpose of this example, let us assume that the maximum price paid is 15 $COHO for this single cargo hold. Therefore this player acquires 15 $COHO in exchange for their single unit of TECH.

Scenario B:

Player B player arrives at the same outpost a few minutes after *Player A* and sells a second unit of TECH. The outpost will now offer a lower price for this commodity than it had in the first transaction with *Player A*. The outpost will use its remaining bankroll to calculate the approximate price it will offer to Player B. Player B will therefore receive roughly 14.775 $COHO for their single unit of TECH.

Scenario C:

Player C approaches a different but otherwise identical outpost, which still has a full bankroll of 1000 $COHO, and is purchasing *Tech Commodities*. *Player C* player wishes to sell 50 units of TECH to the outpost in a single transaction. The price the outpost offers for the 50 units of TECH would therefore be approximately 10.606 $COHO average per unit (see chart below) or 530.309 $COHO total purchase price (with the 50th unit selling for roughly 48% or original, maximum possible unit price).

Below: 50 units of Tech Commodities being sold in a single transaction



By adjusting the *bankrolls associated with each commodity* that outposts purchase, price adjustments can be made without requiring management of the commodities themselves (which can simply be burned upon sale).

It is worth noting that not all outposts will necessarily sell the same commodity at the same price as another with an identical bankroll, because during actual gameplay there are other factors which may influence prices paid per unit of a given commodity. For our purposes however, such variations can be disregarded, as the overall principle of *price paid relative to bankroll on hand* primarily informs the prices outposts pay to players for the commodities they are purchasing.

Note that the example above describes an outpost with a relatively small bankroll (1000 per commodity) to illustrate the price inflation per unit sold. If the outpost had a bankroll of 3000 or 4000 for this

commodity, the price would decrease more slowly, enabling multiple profitable trades. In this instance, after selling roughly twenty units, the player would likely look for a more lucrative outpost to trade with.

4.4.2 Outposts selling commodities

Outposts selling commodities function similarly to outposts buying commodities, but do not require any financial subsidies as they do not have bankrolls. The commodities in the *outpost inventory* provide a very similar function as bankrolls however.



When an outpost has a full inventory of a given commodity, it will sell one unit of its inventory at its lowest possible price. As players purchase additional commodities from the outpost, the price it sells this commodity for will increase relative to its remaining inventory. The function of price paid vs. inventory is essentially the same as outlined above in section 4.1, only in the inverse and relative to inventory instead of bankroll. In actual gameplay, these numbers will vary depending on a myriad of factors, but the principle works for a basic understanding of commodity purchasing vs. commodity selling.

As a result, the sale price for outposts is adjusted on an epoch by epoch basis, and inventory (rather than bankroll) is automatically adjusted (without the need for economic assistance from the Stimulus Module).

4.5 Interest Deposits

Players can earn interest on the $COHO they have accrued in-game by depositing it in either a StarMall Bank or Planetary Bank.

4.5.1 The StarMall Bank aka *Bank of Galactica*

All players are free to utilize the banking services available at the StarMall and earn interest on their deposits. This is also a mechanism to allow players to keep a limited amount of $COHO on hand while trading (and the remainder in the bank), to mitigate the potential losses if they are attacked while exploring the universe. The limitation on StarMall banking is the maximum deposit threshold. Players are only able to earn interest on deposits up to a given amount, and there is a maximum deposit limit. It is also worth noting that StarMall banks pay a lower interest rate than Planetary Banks, but unlike Planetary Banks, funds deposited in the StarMall bank are entirely secured.

4.5.2 Planetary Banking

Planets that have been sufficiently developed feature a Planetary Bank. Private *planetary banks* pay out a higher interest rate on deposits, and have a much higher total deposit limit. Like StarMall banks, planetary banks similarly pay out interest on the entirety of the total deposit until the total deposit limit is reached.

Players should note however that funds in a planetary bank are only as secure as the strategic defenses of the planet itself. If another player can overcome these defenses, they may capture the planet along with any funds in its planetary bank.

5 Special Missions / Quest Rewards

In addition to standard gameplay, Qwoyn will create and promote periodic *Commissioned Expeditions* (such as treasure hunts or other special missions) that players may choose to participate in. The rewards from commissioned expeditions will primarily be in-game assets, but rewards in $QWOYN, $COHO or tokens from other chains within the Cosmos Ecosystem may also be available for players that successfully complete such missions. Reward funding for special missions will come from the Qwoyn Community Pool.

6 The Invisible Hand and $QWOYN Sustainability

Whenever possible, Adam Smith's[4] invisible hand should govern player actions and economic dynamics within the Cosmic Horizon universe. This approach empowers players to develop their own styles of play and individual strategies for $COHO accrual and military success. Wherever possible, free play and unencumbered economics are preferred.

The integrants of the Cosmic Horizon economy that do require economic intervention have robust mechanisms to do so, and whenever possible, such intervention is performed in conjunction with the secondary goal of incentivizing player behavior that is conducive to engaging and dynamic gameplay.

[4] A human economist who proposed theories that are closely aligned with Tar'ri economic philosophy.

Qwoyn Studios itself earns funds to sustain core infrastructure and support blockchain health by selling in-game assets such as avatars, ships, accessories, upgrades and related assets. Some in-game assets will be available on a limited basis, at a slight discount when purchased with $USDC or a similar stablecoin. Doing so offers a value proposition to Cosmic Horizon players while sustaining Qwoyn Studios operations and a stable and transparent value proposition for $QWOYN token holders. Qwoyn Studios also earn proceeds in $QWOYN and may burn a portion of the $QWOYN acquired to further maintain the balance of $QWOYN/$COHO in the private LP.

It is our goal to establish a utility rich platform for future development and developers, but also a robust and sustainable underlying blockchain, whose value is transparent and based on the utility and innovation it brings to the ecosystem (and gaming as a whole). Proceeds earned by Qwoyn Studios support continued operation, growth, development and improvements to Cosmic Horizon and the Qwoyn blockchain, as well as future projects led both by Qwoyn, independent creators, or established game studios.

In addition to building a sustainable blockchain, Qwoyn Studios believes in supporting a sustainable ecosystem for its users to live in and support for future generations pursuit of the sciences. It is for this reason that Qwoyn Studios is integrating Regen carbon credit retirement into the terraforming mechanism of Cosmic Horizon, and will establish the Qwoyn Foundation.

Qwoyn Studios aims to create an immersive, sovereign, engaging and sustainable web3 gaming universe, where traditional gamers and Cosmos/Web3 enthusiasts alike can come together, collaborate, strategize and do battle for supremacy of the Cosmic Horizon universe.