

## Selendra Economic Paper

*By Selendra Team*

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[ Draft 1.3]



# Selendra

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LEGAL DISCLAIMER: This document describes various aspects of the Selendra Blockchain Network. Updates to this document will be posted on the Selendra github ([github.com/selendra](https://github.com/selendra)) and the Selendra Telegram channel ([t.me/selendranet](https://t.me/selendranet)). This document contains forward-looking statements which are subject to risks and uncertainties that may result in a loss of investment capital. Always give thoughtful consideration using due diligence when investing.

# 1. Introduction to Selendra

Selendra is a special purpose multi-chains nominated proof-of-stake network built with the Polkadot Substrate Framework to facilitate micro-economic transactions. It is designed to be interoperable with other open blockchains and developable by developers and students with very minimal learning curve, and ease of use for end-users to interact and benefit from blockchain technology.

Selendra represents a global network of organizations and individuals whose growth and stability are made possible through the deployment of value-added applications.

Our mission is to empower young developers throughout the world to quickly and easily learn to create blockchain user-friendly applications for commerce, trade, education, entertainment, storing of data, decentralized computing, assets tokenization and much more.

Selendra simplifies distributed asset tokenization systems, digital smart contracts, encrypted and decentralized content storage and retrieval, identity, governance and voting systems, internet-of-things and many other network based micro-transactions.

Selendra empowers developers to build blockchain-based business applications with a minimal learning curve, thus expanding mass user-adoption into the global blockchain landscape.

We aim to enhance the value of the Selendra (SEL) network over the long-term as we attract bright, young and progressive developers, forward-thinking investors, and user participants with combined interests toward achieving a common vision and goals.

As we reach out to all network users of the world, our vision is to always strive toward building the best open blockchain infrastructure, maintaining a focus on contributing health and wealth into the newly emerging global blockchain superstructure.

At the time of writing this paper, Selendra development has reached testnet stage and is being tested with several group decentralized applications (dapp).

## 2. Blockchain - A General Overview

With the invention of paper, the printing press, telegraph, telephone, and digital networks, each opened revolutionary new ways for individuals to communicate and share. With the discovery of blockchain technology, the world is presented with another new revolutionary method for the transmission and exchange of secure data transactions without an intermediary.

Blockchain is a newly emerging technology holding the potential to revolutionize the way we interact digitally. With the advent of simple digital networks, the ability to exchange information became quick and easy. With blockchain, in addition to the quick and easy exchange of information, we now have the ability to *exchange value*.

Within the next decade, businesses and governments will continue the steady shift toward peer-to-peer networks and shared economic models. Blockchain represents the next iteration of computing beyond the Internet, offering a combination of six unique features not found in earlier network applications.

1. Information held on the blockchain is decentralized, meaning that data is distributed and securely stored among network users without central control, resulting in no single point of failure, bringing stability and resiliency to the network.
2. Once data is entered on the blockchain, information recorded on the blockchain is immutable, and cannot be changed, modified or altered, making it ideal for creating time-stamped events, registration records related to ownership of assets, such as land, homes, automobiles, financial instruments, voting ballots, identities, or test scores.
3. Transactions recorded on the blockchain are transparent and visible to the public, creating a digital environment of trust, allowing for crypto assets to be held and exchanged as value, and for contracts to be recorded and executed.
4. Blockchain provides data integrity, allowing for transactions to be complete, accurate, trustworthy and verifiable at any time. Blockchain algorithms are designed to reach consensus with regard to transactional validity, and completed transactions cannot be altered.
5. Information on the blockchain is cryptographically secure through the consensus process maintaining the security and integrity of shared data.
6. With reduced reliance on centralized computing and data storage, blockchain technology is efficient and saves money, having the potential to lower costs and improve the efficiency of business transactions and record keeping.

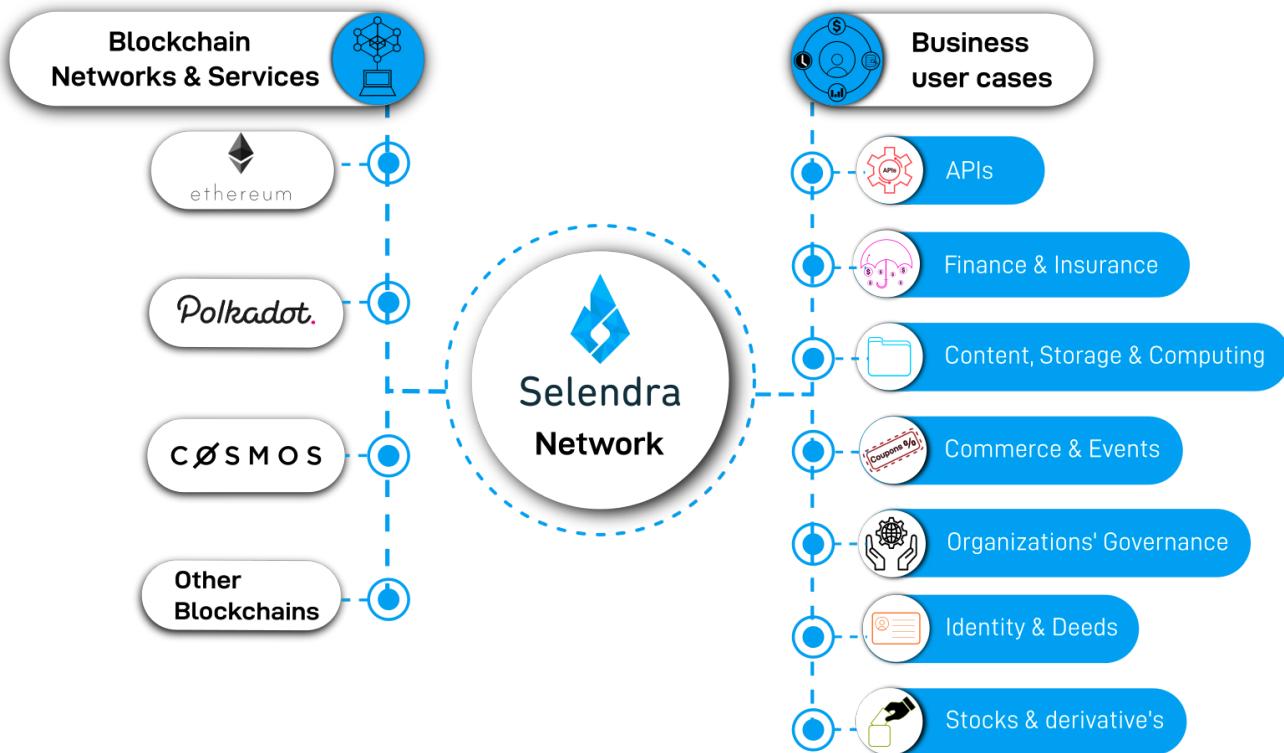
As a newly emerging industry, practical blockchain business applications remain limited and inaccessible to most. As with the early adoption of the Internet, full-scale user-friendly applications were years in the making. Blockchain development today is similar to the emergence of the early Internet, with many useful game-changing applications to be deployed in the near future.

### 3. Selendra Benefits

At present, blockchain application development and mainstream user adoption are hindered by the fact that diverse blockchain networks cannot share data outside its own native chain. In addition, network fees become excessive as native token value increases.

While attempts have been made toward solving these issues, solutions thus far have been out of reach for upstart developers. New applications are difficult to develop and deploy, while being incompatible with existing data and network applications.

Blockchain technology is indifferent to first generation Internet office and ecommerce applications, and there is no single blockchain network capable of solving all potential application needs. Instead, several different blockchain projects working together are necessary, each solving specific problems according to design.



Selendra is designed upon a philosophy of openness and connectivity, acting as a gateway to other blockchain networks, resulting in an extended range of new business use-cases.

The Selendra community benefits through receiving access to a broad range of services available within a single user-friendly development environment that is compatible with Ethereum, Polkadot, Cosmos, other blockchain networks, and non-native network nodes.

## 4. Selendra Architecture

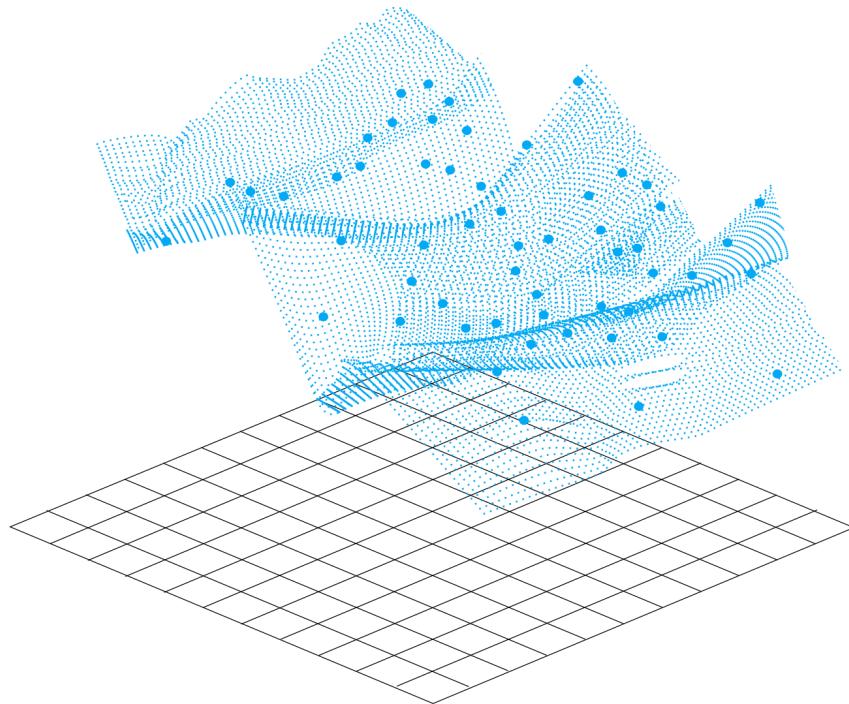
### a. Architecture: General Overview

The **Selendra Network** is built upon the Polkadot Substrate framework, a diversified multi-chain architecture focused on interoperability and ease of development, allowing greater opportunity for early developers to build their own private networks.

Selendra architecture provides for a shared, distributed, decentralized, immutable ledger that facilitates the process of recording transactions and tracking assets in a peer-to-peer digital network through providing smart contract services which generate transactions on the blockchain network.

Selendra architecture is an extensible, modular, open-source framework with multi-sharding capabilities. Sharding is a database partitioning technique which allows for the deployment of parallel blockchains, or para-chain networks, which are bridged to operate alongside Selendra's main blockchain environment, enabling scalability, faster processing, and reduced network latency.

Selendra para-chains allow developers ease and freedom to build their own unique blockchain applications in parallel with the Selendra network, effectively running sub-networks under a Selendra framework.



### b. Architecture: Forkless Upgrades

As with all software, to remain timely, useful and relevant, blockchain software requires upgrades for continued development. Early generation blockchain upgrades required forking, a process requiring weeks, if not months to deploy.

Upgrades through the forking process can become controversial, sometimes leading to a hard fork, which in essence splits the development community in two. Selendra employs forkless upgrades enacted through an on-chain governance system, thereby creating enhanced stability through avoiding the forked upgrade process altogether.

### c. Architecture: Consensus Roles

Selendra has four distinct roles for reaching consensus:

1. Validators secure the network through the process of staking, validating proofs from collators, and through participating in consensus with other validators.
2. Collators maintain data shards by collecting shard transactions and producing proofs for validators. They also monitor the network and report abuse to validators.
3. Nominators secure the network by selecting trustworthy validators and stakers.
4. Fishermen monitor the network and report abuse to validators.

### d. Architecture: Governance Roles

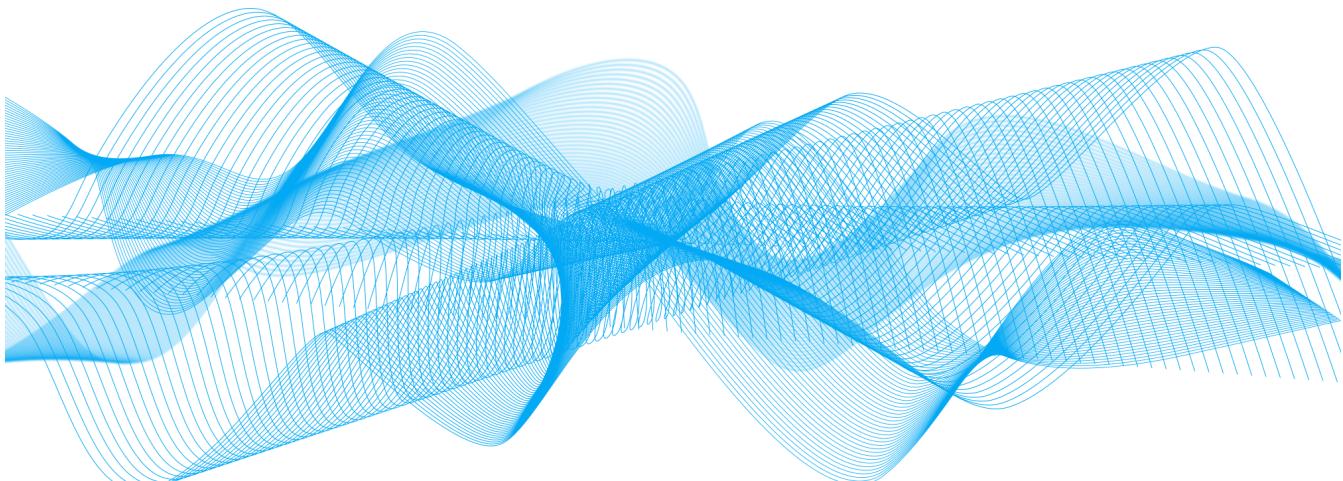
Selendra uses a governance mechanism of two distinct committee types that ensure the majority of stakeholders will always secure the network.

1. Holders Council committees are elected to represent passive stakeholders in two primary governance roles, which are proposing referenda, and vetoing dangerous or malicious referenda.
2. Technical committees are composed of active Selendra developers who propose emergency referenda and new features together with the Holders Council for fast-tracked voting and implementation.

### e. Architecture: Rewards

Selendra is a Nominated Proof of Stake blockchain that incentivizes decentralization to maximize chain security through two primary role mechanisms, that of validators and nominators.

Validators with greater stakes tend to have more resources for maintaining infrastructure, therefore, validator rewards are paid the same regardless of stake level. Generally, validators with lesser stake levels will pay more to nominators, whereby nominators have an economic incentive to shift toward lower stake validators, resulting in more evenly distributed stakes across validators and avoiding concentrations of power.



## f. Architecture: Transaction Fees

Transaction fees are among the greatest barriers hindering mainstream adoption. Selendra's approach to this issue is to make transaction fees fixed and very low from the start. Selendra transaction fees are fixed at 0.00001 SEL per transaction. Since the cost per transaction is fixed to the SEL token, the cost per transaction will only vary relative to the SEL token price.

For example, assuming 1 SEL token is initially valued at 0.025 USD, the chart below demonstrates transaction fee variations as the price of a Selendra (SEL) token increases in price.

\$ Price/SEL	USD per Transaction	# of transaction/USD
\$0.025	0.00000025	4,000,000
\$0.25	0.0000025	400,000
\$2.50	0.000025	40,000
\$5.00	0.00005	20,000

Comparatively within the greater blockchain community, Selendra transaction fees are very low, and will always remain low, even with significant increases in the Selendra (SEL) token price as the above chart illustrates.

Long-term low and stable transaction fees allow developers and the community to be more experimental with application development and usage, thereby encouraging innovative development and activity on the network, especially with regard to the deployment of private para-chain applications, bringing greater overall value to the network.

Network governance bodies such as validators, nominator, collators and fishermen are rewarded through the staking process, with 30% of transaction fees being paid as rebates, while the remaining 70% are taken out of existence.

## g. Architecture: Network Abuse Mitigation

As Selendra transaction fees are inherently low, the possibility of attack on computing resources is a possibility. To mitigate this issue, prior to performing any transaction, Selendra account holders must maintain a minimum balance of 0.10 SEL (this minimum balance amount will be adjusted accordingly as the network develops).

A minimum balance deposit is used to deter network attacks, where the deposit is forfeited upon detection of network abuse. Forfeited deposits are added to the reward pool fund for future payments to validators and other network participants.



## 5. Selendra Tokenization Structure

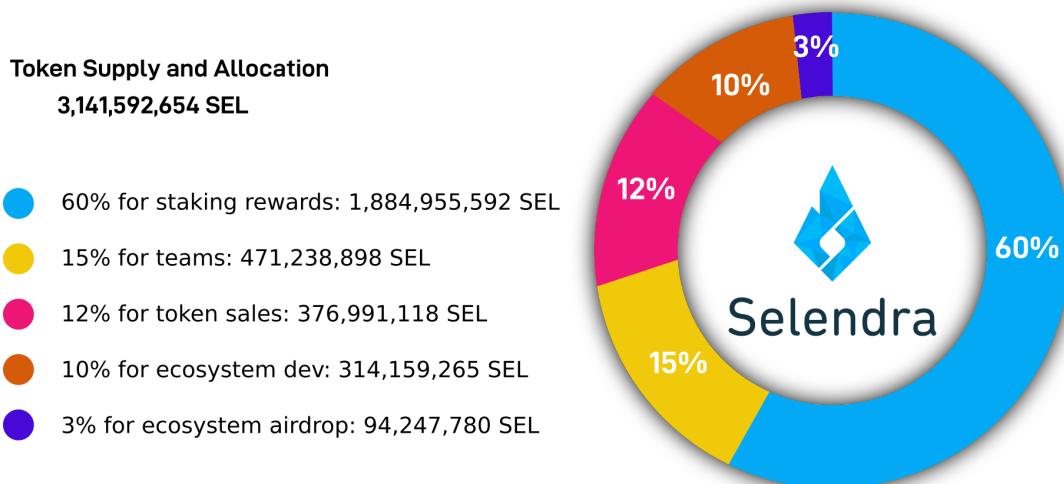
Selendra offers a dual token program; the utility token (SEL), and the stable token (RISE). SEL is primarily used for reward network nodes, validators, and ecosystem application development, while RISE is primarily used for dapps and applications payment.

### a. The SEL Utility Token, Supply and Allocation

SEL is Selendra's native utility token which is used for:

- payments for processing transactions and data storage
- staking rewards for network validator nodes
- tallying governance votes for determining network resource allocations

The SEL utility token is crucial for processing transactions and storing data, together with maintaining network security while fostering good governance and growth. Selendra tokens are distributed among five major participating groups within the network as allocated and written in the genesis block.



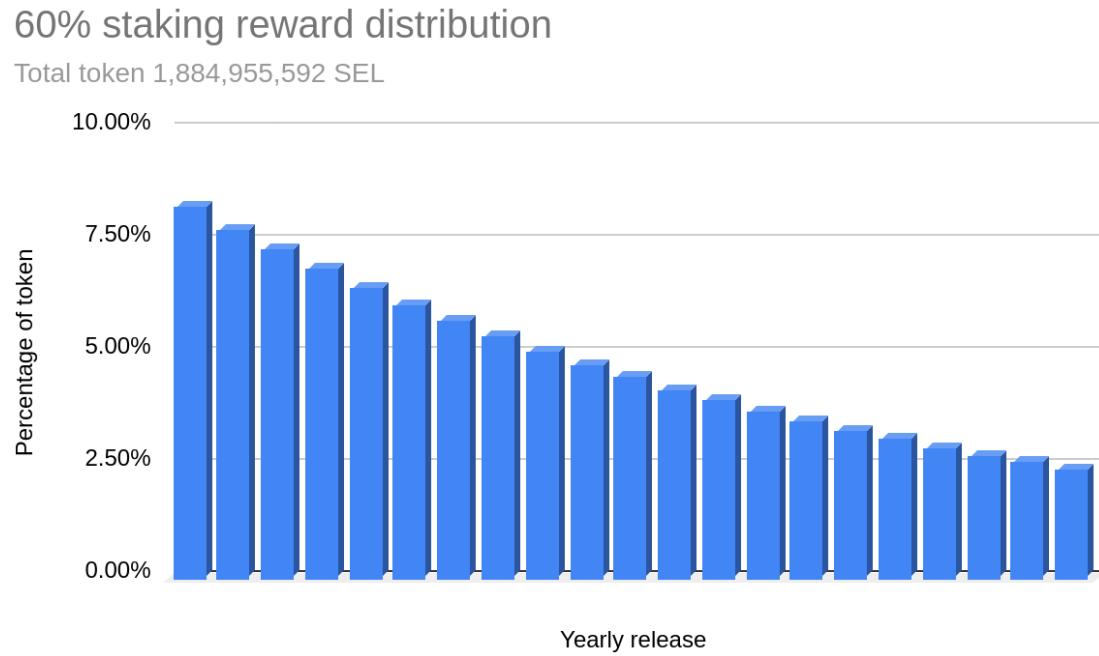
Each allocation group is critical to the network's creation, infrastructure, development, and growth:

- 60% for Selendra mining block rewards over 20 years, released decrementally every 3 years after the main launch (see detailed release schedule). Rewarded to validators, collators, nominators, fishermen, and service nodes for securing, providing storage, maintaining the blockchain, and running contracts.
- 15% genesis allocation to Selendra teams with 15 year, 1% per year linear incremental vesting beginning 2 years after main launch. For research, engineering and deployment, business development, and marketing.
- 12% genesis allocation for investors with 6 month to 3 years linear vesting. For funding network development, business development, partnerships, and support community.
- 10% genesis allocation for the Selendra Foundation with a 10 years linear distribution. For long-term network governance, partnership support, public works, community building, and grants.
- 3% genesis allocation for airdrops with a 4.5 year linear distribution. A seed for broader communities who otherwise wouldn't have a chance to participate in the distribution.

## 6. Staking Rewards Release Schedule

Whereas Bitcoin uses a half-life model every 4 years, Selendra (SEL) staking reward releases are distributed according to a declining 6% annual payout.

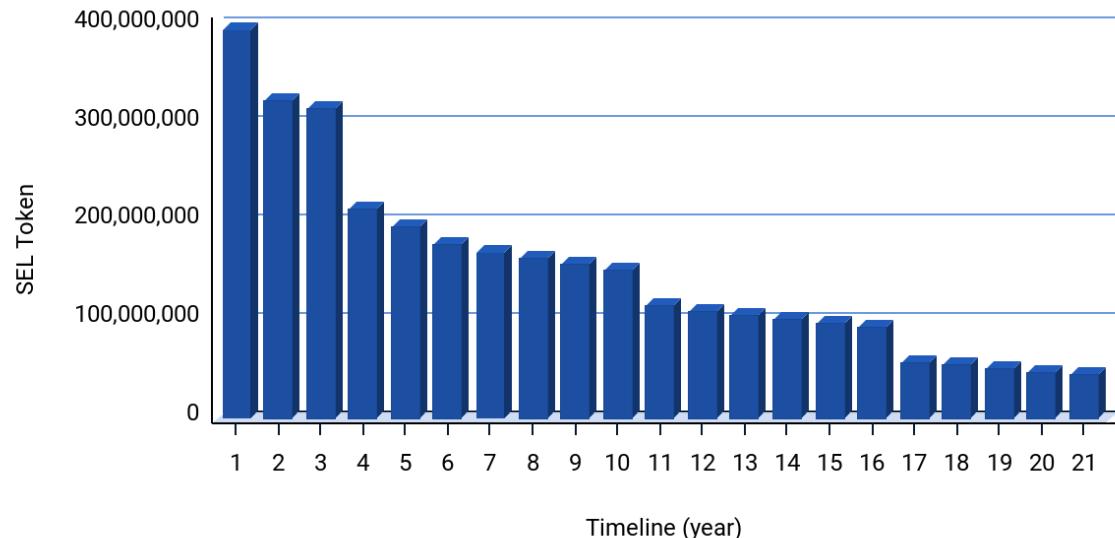
As per the graph below, during the first year of the initial network launch, approximately 8.25% of total staking rewards are released. During each of the following years, for the next 20 years, there will be an approximate 5 to 6% decrease in rewards payable from year to year until all rewards are distributed.



In the advancing world of blockchain application development, as our reward distribution cycle reaches full maturity, the Selendra reward schedule lays a solid foundation for first generation stakers and developers while continuing to reward the next generation. Selendra's graduated decremental release method offers greater fairness for later-stage next-generation entrants as well as for early developers and stakers.

### Total token distribution projection

Token supply 3,141,592,654 SEL



## 7. Token Vesting Schedules

### a. Introduction

Selendra token investors come in all sizes, both large and small, a globally diverse group of forward thinkers with interests in business, economics, and blockchain network development.

To embark on any ambitious project, initial seed capital is often needed, and initial token sales to early-stage investors help provide this necessary start-up capital. Accordingly, we seek a broad range of token investors from a variety of industries, groups and organizations.

### b. Vesting: Token Sales and Discounts

Selendra token sales will consist of private sales and IDOs (*initial decentralized exchange offering*). The private sale is conducted to onboard private investors who are willing to put in a bigger fund to the project . IDOs are open to everyone who wants to participate at any funding size.

Instead of requiring long-term vesting schedules, investors are rewarded with purchase discounts while providing multiple options for different risk profiles. Such vesting purchase discounts create long-term project alignment, and serve as a powerful incentive for early network development.

### C. Vesting: Strategic Advisors

*Strategic Advisors* are individuals and organizations who have made a strong and significant long-term commitment toward the growth and development of the Selendra network, while receiving the potential for reward.

Initial token sales to *Strategic Advisor* investors are offered with a graduated discount schedule, rewarding early-stage investors who are willing to accept the risks involved toward building the network.

*Strategic Advisors* are offered vesting choices of 1 to 3 years at discounts of 10 to 30 percent, with a minimum vesting schedule of one year and 5,000 USD, or an equivalent amount in other redeemable crypto assets.

### d. Vesting: Selendra development teams

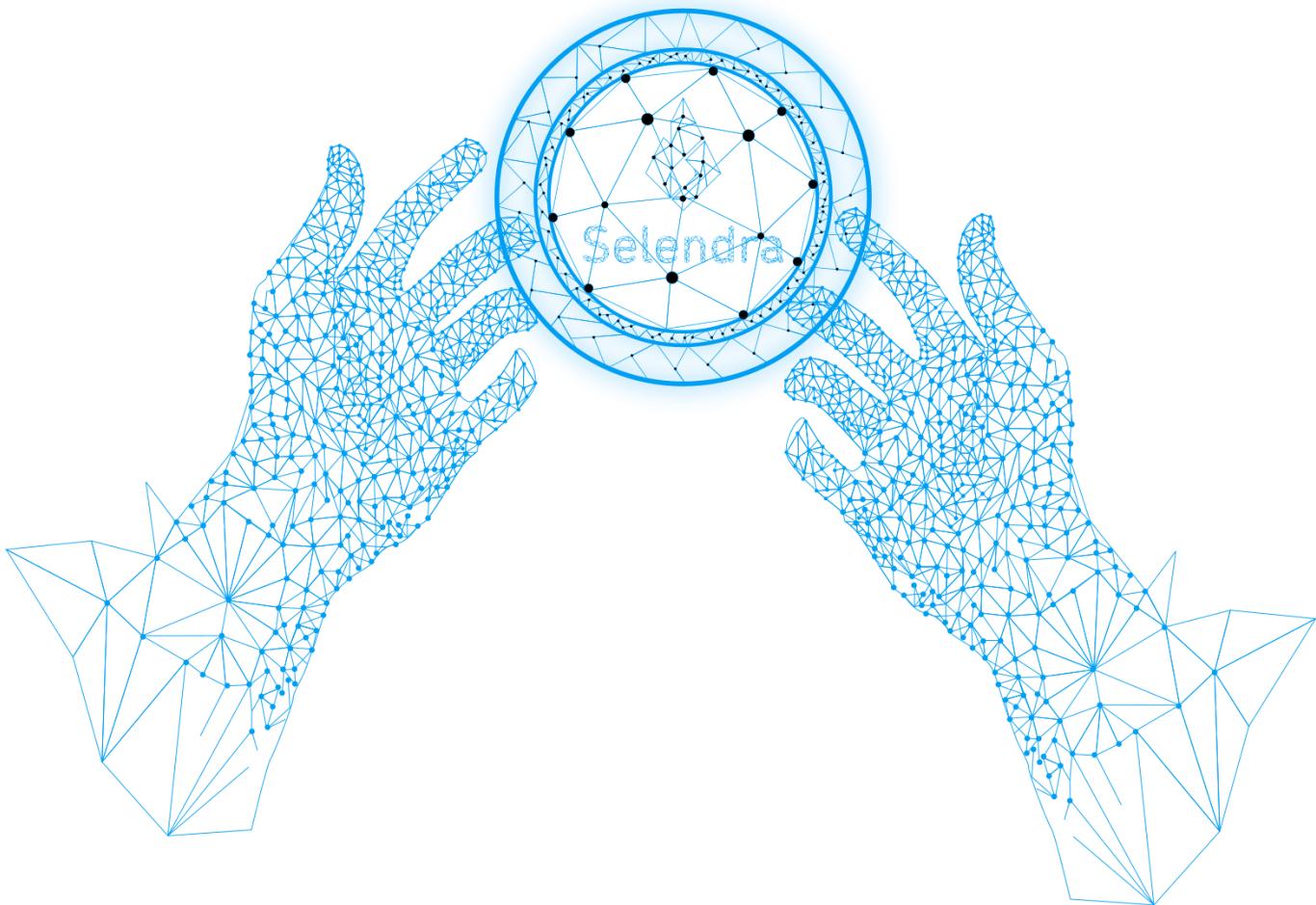
Selendra development teams bring a long-term commitment toward building a strong network for mainstream users, next generation developers, token investors, and other network participants. Selendra development teams are rewarded through a linear vesting model over a 15 year period, receiving rewards of 1 percent per year commencing two years after initial network launch.

#### e. Vesting: Selendra Foundation

The Selendra Foundation's role is to support developers, educators, community builders from all walks of life to bring value-added to the Selendra network. The foundation has in reserve a 10 percent total reward pool to be distributed at a rate of up to one percent per year over the span of ten years with payouts commencing after the initial launch.

#### f. Vesting: Stakers & Validators

Sixty percent of all tokens are held in reserve for the reward pool is gradually distributed to stakers and validators over a span of 20 years. During the first 6 years after launch, 45 percent of this reward pool will be distributed. After 20 years of network development, when the reserve reward pool depletes itself, transaction frequency and amounts will have risen sufficiently to provide adequate revenue generation for validators and stakers through transaction fees and tips alone.



## 8. Potential Use Cases

With the advent of blockchain technology in general, modern man has crossed a next-generation digital threshold, with business application opportunities abounding for young, progressive entrepreneur developers on the cutting edge of this technology. The Selendra Blockchain Network provides exciting, new, practical solutions for:

- decentralized e-commerce applications
- asset tokenization distribution and management
- identity management
- financial inclusion
- insurance
- decentralized computing and storage
- Internet of Things (IoT) applications
- Gaming applications
- Music and arts industry
- Decentralized autonomous organization (DAO)
- and much more

[Use case scenarios in finance, commerce, and asset tokenization:](#)

1. Shares of ownership in business and enterprise, along with shareholder trades and dividend payouts are better managed through blockchain tokenization than through traditional accounting methods.

Business entities presently forming under *SmallWorld Venture Ltd.* will be among the first to be implementing a tokenized asset and management system. We see asset tokenization as a revolutionary new technology that will forever change modern digital trade and management systems.

2. Tokenized investment pools are for investors large and small with a common goal. The traditional investment landscape is changing where any investment asset can be tokenized, while investment pools can invest in almost any asset. *Security Token Offerings (STO)* and tokenized special interest investment pools offer transparency, fractional ownership, and trading on secondary markets.

At present, the Selendra team is developing a blockchain asset tokenization and management model which will be used to govern the investment pool of 30 investors. A custom token built on a Selendra network sub-chain will represent the group while the assets will be held and traded through the *Bitriel Wallet*.

3. *BitrielSwap* is a planned decentralized token exchange for the Selendra network where issued tokens which are not traded on a major exchange may be traded against other hosted token projects thereby opening up liquidity options. The *BitrielSwap* exchange will be integrated into the *Bitriel Wallet* and will allow for trading and fundraising options within the wallet on a secondary market.

4. [VitaminAir](#) is a catalyst for a global movement to reforest the rainforest and regenerate our ecosystem through platforms and models that incorporate technology and designs inspired by nature. In the process, we're growing a community of people engaging in social, cultural, ecological and economic regeneration.

VitaminAir will tokenize 30 hectares of farmland and farmland production where anyone can legally and safely incrementally invest in real estate. Invested funds are applied toward land, farm and community development, including the acquisition of additional hectares.

5. [Albazaar Marketplace](#) is a planned virtual marketplace where goods and services can be exchanged through smart contracts in a peer-to-peer network, together with all the other added benefits blockchain technology has to offer. Buyers and sellers are empowered through the community where transactions can be negotiated with confidence.

6. [Villages Wi-Fi](#), a hotspot mesh network with local contents cached that provides internet access to villagers, one village at a time. Mesh networks offer options for local internet that help bring down the cost of data. Incentives users to browse useful contents or relative ads, while internet fees are paid via RISE or SEL.

7. [SALA KOOMPI](#), a virtual school that incentivized teachers to create good quality video contents and students to fairly rate the cause they learned. Anyone can open a school, similar to a personal Facebook page, but focus on video education. SALA KOOMPI believes that anyone has some good to share and enlighten the world, if incentives are fairly and openly distributed.

## 8. Decentralized Autonomous Organization (DAO)

Selendra Foundation will be the first of many Decentralized Autonomous Organization (DAO) projects to operate within the Selendra Network, and will serve as a prototype. The Selendra DAO will manage the allocated 10 percent foundation reserve, and will be used to fund additional projects to grow the Selendra network.

## 9. [Plant your change: Stake your Trees and Transactions.](#)

In the near future, millions of transactions will be conducted through the Selendra network. Selendra wants to represent these transactions by planting one tree for every 100 transactions.

Imagine a community harmoniously supporting a 10x sustainable adoption of blockchain technology with the environment. Selendra wants to be part of that change and commit from the start to fund tree planting and forest conservation.



A baseline from the New England Forest Dept estimates that 3,000 trees per hectare need to be planted. Our goal over the next 20 years is to plant 700,000,000 trees covering nearly 250,000 hectares. Together we can make a difference.

# 9. Roadmap

A brief history of Selendra in cryptonomics

2015 : Blockchain R&D started

2016 : Bitcoin OTC (over the counter) via Bitriel for travelers who want KHR and USD

2017 : Piloted remittance application between SG/KH with Stellar Blockchain

2018 : Formation of Selendra team under Zeetomic codename

2019 : Pilot loyalty programs for local restaurant chains on Stellar Blockchain  
Selendra Blockchain R&D with Substrate framework began

Nov 2020 : Selendra testnet launched

Dec 2020 : Onboard 3 beta applications to testnet as test cases;

- Albazaar decentralized marketplace
- KOOMPI Fi-Fi users' reward and payment
- Bitriel blockchain wallet

Done 2021

- Issued SEL BEP-20 token on Binance Smart Chain
- Kickoff airdrop and online build community
- Improve Bitriel wallet to support BSC tokens, ERC-20 tokens, Polkadot
- Update whitepaper
- Connecting with investors and reach out to exchanges
- Selendra Governance Upgradability
- Nominators & Validators
- Selendra Chain Spec and Github Source
- EVM Compatibility
- Ethereum module
- Selendra chain EVM address
- Selendra JS integrates EVM addresses
- BitrielSwap and liquidity provider
- Bitriel Farming & Smart contract

Q1 2022

- Release Technical Document
- Mainnet launched
- Selendra Governance NPoS
- Proof-of-Existence pallet for NFTs and Tokenization
- Documentation for applications
- Selendra chain block explorer with index

- Bitriel wallet for iOS
- Publish on Apple app store
- EVM Playground UI with Remix
- Piloting Student IDs in partnership with Ministry of Post & Telecom
- DeFi Applications (Solidity Support)
- Selendra RISE DAO Reserve & RICE stablecoin
- Selendra Foundation DAO

Q2 2022

- Ethereum bridge
- Implement Bitriel cross-chain
- Security & tokenization (with Bitriel)
- Asset tokenization Platform & DeFi Platform

Q3 2022

- Selendra Relaychain
- Parachain Template
- Selendra bridge
- Decentralized Distributed Storage
- Storage distributor based on IPFS

Q4 2022

- Polkadot Crowdloan for Parachain

## 10. Team

Selendra is the brainchild of SmallWorld Venture, a venture seed funder based in Phnom Penh, Cambodia. SmallWorld Venture began in 2011 by providing a collaborative workspace for entrepreneurs and startups.

Selendra has been in research and development since 2015 by a group of young technology enthusiasts that joined the SmallWorld Venture community.

This team is a self-taught, peer-to-peer community that learned to build real-world applications and products useful for users in emerging markets. The Selendra development team grew out of this community.

Our team brings a wealth of experience, dedication and passion for creating a user-friendly blockchain network that will add value to everyone's lives. The goal is to create an easy, fun, and valuable network for local and global users.

### Harmony with nature

The team loves integrating technology products with nature to create a sustainable product that can benefit everyone. In June 2021, our core development members will relocate to VitaminAir, a jungle office 110km outside of Phnom Penh city, living off the land while creating sustainable agriculture and forestry programs powered by technology.



### Guiding Principles

To develop and grow Selendra, our team has designed principles to develop the project.

1. Surround ourselves with inspiration, real-world problems and our stakeholders.
2. Take the long term view on projects
3. Open framework for utilizing diverse disciplines and perspectives
4. Aim for 10x, not 10%
5. Fall in love with the problem, not the solution.

Selendra is crafted and built by these friendly folks.



**Rithy Thul**

Co-founder, CEO



**Saing Sab**

Co-founder & Infra



**Daveat Corn**

Fullstack mobile dev



**Nath Lay**

Blockchain dev



**Hang Leang Sun**

Full-stack smart contract dev



**Piset Heang**

Full-stack webdev



**Ramesh BN**

Senior Blockchain Dev



**Max Thornton**

Business Dev & IRs



**Vannak Lach**

Communication



**Vanna Kruy**

Tech Advisor

# Links

Website	: <a href="https://selendra.org">https://selendra.org</a>
Github	: <a href="https://github.com/selendra">https://github.com/selendra</a>
Twitter	: <a href="https://twitter.com/selendrachain">https://twitter.com/selendrachain</a>
Telegram coms	: <a href="https://t.me/selendrachain">https://t.me/selendrachain</a>
Telegram channel	: <a href="https://t.me/selendrachainofficial">https://t.me/selendrachainofficial</a>
Medium	: <a href="https://medium.com/selendra">https://medium.com/selendra</a>

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The New England Forest:

[https://www.fs.fed.us/ne/nnewtown\\_square/publications/resource\\_bulletins/pdfs/scanned/OCR/he\\_rb124.pdf](https://www.fs.fed.us/ne/nnewtown_square/publications/resource_bulletins/pdfs/scanned/OCR/he_rb124.pdf)