

# Neoplay Whitepaper

Version 2.0

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## Abstract

Neoplay is a decentralized, provably-fair, cross-network dicing platform that enables users to place bets on the result of a random 100-sided dice roll. Users will have the ability to place bets in Ether (ETH) or GAS (NEO dividend) and subsequently choose their odds of winning. The Neoplay protocol enables players to reroll through the sister NEO and Ethereum smart-contracts. Players will have the option to spend Neoplay's native tokens [EPLAY & NPLAY] to reroll their losing bets against the house while the user's odds of winning and payout remain unchanged. Users holding enough of the respective smart-contracts native token, NPLAY for NEO and EPLAY for Ethereum, can effectively never lose. Assume a player rolls and loses, if the player has a positive NPLAY or EPLAY balance they will be prompted to reroll. In the event that the player wins the reroll, they will be credited their winnings immediately. In the event that the player loses the reroll they will be prompted to reroll again. The reroll cost will be a function of the initial amount bet and the expected payout of the bet. A player without Neoplay's native tokens can still bet in either ETH or GAS but will be objectively handicapped counter to a player who owns and utilizes the tokens. **Neoplay will immediately burn every token used to reroll losing bets the moment the reroll mechanic is invoked by the user. Burning tokens will result in a permanent decrease in the total available supply of tokens.**

## Bringing Dicing to NEO

Ethereum has mostly accomplished its primary goal of improving applications over the internet. The platform was first to enable users to create dApps (decentralized applications) and smart-contracts on a generalized blockchain. As a result, Ether quickly grew in market capitalization over the 2016 fiscal year alongside countless dApps built on its network. Dicing applications built on the Ethereum network have become some of the most profitable projects for those fortunate enough to have been initial token holders. Given the nature of these decentralized gambling applications, return on investment has been consistently very high.

The Chinese competitor to Ethereum, NEO (formerly branded as Antshares) released an alternative to Ethereum's development tools. While Ethereum's focus remained on creating a smarter internet, NEO's objective is to create a future "Smart Economy" through the utilization of the NEO blockchain and its programmable management of new and existing digital assets.

The NEO platform innovates on the Ethereum network in many respects. As of present, the NEO platform allows developers to write their smart contracts in 6 different languages<sup>1</sup>. Ethereum requires new developers to learn their Solidity language. NEO's high-level multiple language support allows for greater and quicker growth as new blockchain developers have zero to no barrier to entry. The inclusivity of NEO smart-contracts does not compromise its safety or functionality, on the contrary, NEO allows for greater certainty, performance, and expandability. Despite its explosive growth and innovations, NEO still has relatively few smart-contracts built on top of its platform; however, this is rapidly changing<sup>2</sup>. There are currently no

gambling or dicing applications built on NEO. Non-viable applications built with minimal to no effort are not counted. Neoplay is strategically positioned to leverage existing innovations, in addition to its own innovations (Cross-network, Rerolling, etc.), for dicing and institute them onto the NEO blockchain. Moreover, Neoplay aims to grow the online gambling industry into the future smart economy NEO was designed for.

As of present NEO's total return on investment (ROI) has eclipsed Ether's. NEO has an extraordinary +220,000% ROI since release versus Ether's +173,000% ROI<sup>3</sup>. Both are impressive however NEO's market cap is also significantly smaller<sup>4</sup> which in turn allows for future investment in the Chinese alternative to yield higher returns.

## Provably Fair

Dicing applications are only as viable as the methods they employ to generate random numbers. Many solutions were initially based on the inherent complexity of the blockchain. Random numbers could be derived using transactions, blocks, user hashes or any complex combination of this set fed through various hashing algorithms. These methods have proven to be successful for countless projects on blockchain-based networks but they are not absolute. These methods are pseudo-random, meaning they require seeds (a base set of characters used to feed the hashing algorithms). These seeds could become a primary vulnerability. By identifying the source of these seeds, users may begin to accurately predict the resulting numbers generated. This is especially true if the seed generation is predictable in form (block or transaction hashes). For the reasons outlined above, Neoplay has decided against bringing pseudo-randomness into the modern cryptographic marketplace.

Neoplay places itself in the middle of a delicate balance. Generating random numbers is computationally expensive, leading to high gas prices and hurting end user experience. Cheaper methods (like those mentioned earlier) bear too many vulnerabilities. The leading solution for random number generation has been random.org which will be referred to as RO from here on. Pulling from RO provides numbers generated without seeds allowing for Neoplay to operate with truly random numbers. RO derives its random numbers from atmospheric noise made up mostly by lightning strikes occurring 40 times per second, 3.5 million times a day<sup>5</sup>. RO is a verified and viable source for providing an exceptionally high level of randomness appropriate for any conventional or crypto-based gambling platform.

Given the nature of Neoplay being a cross blockchain platform, there are unique challenges. Neoplay has developed sister tokens (NPLAY and EPLAY) on the NEO and Ethereum blockchain respectively. The tokens and their smart contracts should employ the same standards of random number generation irrespective of which contract the user chooses. This may seem technically unfeasible however the solution lies in the access to oracles. Oraclize, Ethereum's most popular Oracle, can be leveraged for random number generation on the NEO blockchain. This solution is partly why the creation of a dicing platform on the NEO blockchain is finally

possible. As of date, there are no large Oracles that exist on the NEO blockchain. On each chain, numbers are pulled from RO and assured with a TLS Notary proof. These TLS Notary proof verify that the data pulled from RO is delivered without any tampering from Neoplay or any other party.

## Platform Potential

The global online gambling market was worth 37.91 billion dollars U.S. in 2015<sup>6</sup>. Although most gambling revenues generated today are from land-based casinos, the online gambling industry is growing at an accelerating rate. The online gambling market is projected to be worth 59.79 billion dollars U.S. by 2020 more than doubling since 2009<sup>6</sup>. Following the advent of blockchain and cryptocurrencies, users were offered decentralized gambling platforms where many quickly grew<sup>7</sup>. These platforms were incredibly successful pulling in hundreds of thousands of bitcoin (BTC) in bets annually. Up to 60% of all bitcoin transacted were spent in gambling-related activity<sup>8</sup>. A significant share of the online gambling market was captured by these online dicing platforms. Eventually, other cryptocurrencies followed and were integrated into new or existing gambling platforms.

As aforementioned, Ethereum (ETH) quickly grew in value because of its users being able to write, audit, and execute smart-contracts on the blockchain. Dicing platforms that were first to integrate the technology yielded huge market growth. In many respects, NEO is in a similar position as Ethereum was in 2016 in market cap<sup>9</sup> and adoption. A leading problem for many crypto dicing projects is the lack of use cases built for their native token. Lacking or non-existent use cases could stop a platform from scaling in the future and stop its native token from growing in value. Some projects resolve this by letting their native token become the medium in which bets are placed, this solution has a few key weaknesses. Firstly, obtaining the token itself would become a barrier to entry for anyone looking to play on the platform and thus impeding its growth. The token itself is subject to market volatility, potential players might never participate if they feel the tokens market value is too high. The market volatility could also dissuade new players as the value of their winnings could become worthless before the user decides to “cash out”.

Neoplay is building its entire platform around its native tokens while still allowing users to place bets in already established and proven digital assets. With the creation of a reroll system users now have a direct incentive for purchasing and using NPLAY & EPLAY tokens. Players who play the most and reroll the most will also need to purchase more tokens off token holders supporting upward price movement. It is objectively better for players to play on the Neoplay platform and leverage rerolling.

Note: Tokens compensated to the Neoplay team as a founder’s reward will be locked for 8,760 hours. This is done to incentivize development and compensate developers.

## The Reroll Mechanic

The reroll mechanic is unique to Neoplay's sister smart-contracts. The reroll feature will enable players an additional opportunity to win their lost bets against the house in exchange for Neoplay's native tokens. The reroll will cost NPLAY if the user is playing on the NEO blockchain, and the reroll will cost EPLAY if the user is playing on the Ethereum blockchain. In a traditional dicing platform, users would automatically lose their initial bet as soon as they lose a roll. Users can still play exactly like this on Neoplay's smart contracts, however, if the user holds the right token for the smart contract then their loss will be suspended and held by the smart contract. If the user decides not to reroll then the loss will be realized and there will be no way for the user to reroll the last bet from that point forward. If the user does reroll, the respective tokens will be burned by the smart contract and the player's previous roll will be rerolled.

Burning tokens via reroll:

```
function burn(uint256 _value) public returns (bool success) {
    require(balanceOf[msg.sender] >= _value;
    balanceOf[msg.sender] -= _value;
    totalSupply -= _value;
    emit Burn(msg.sender, _value);
    return true;
}
```

If the player wins they will be credited their winnings immediately minus the spent tokens. If the player loses they will be prompted to reroll again if they so chose. If a player is new or chooses against using Neoplay's native tokens they will be able to do so seamlessly.

Neoplay will never sell or mint new tokens to supply new players regardless of how few tokens are left. Players who do want to leverage the reroll system to help them win more will have to ultimately purchase tokens from token holders.

## The Neoplay Sister Tokens (EPLAY & NPLAY)

Cryptocurrency-based projects are volatile and inherently risky, this can dissuade new investors from participating in otherwise viable projects. In response, Neoplay's early development was focused on designing an elegant and effective solution to diversify its platform and mitigate risk. Neoplay developed an Ethereum equivalent to the NEO smart contract alongside an ERC-20 (Ethereum-based) token. Both tokens are functionally identical and operate the exact same way when invoked by the user. Both tokens will also have their own unique total supply pool. The ERC-20 compliant EPLAY token is functionally identical to the NEP-5 compliant NPLAY token. Both tokens will allow players to reroll losing bets, both tokens will be permanently burned when utilized for rerolling on their respective blockchain from their respective supply pool, and both tokens will be credited to crowdsale participants.

## Neoplay Token Protocol

Sister Tokens NPLAY and EPLAY will be initialized as ERC-20 tokens on the Ethereum blockchain. Ensuing the deployment of the NEO smart contract, users will have the option to convert their ERC-20 NPLAY tokens into NEP-5 NPLAY tokens using our application programming interface (API) on a secure blockchain intermediary. NEP-5 compliance is the NEO equivalent of ERC-20 compliance for Ethereum. Neoplay will achieve this by first crediting users ERC-20 NPLAY tokens that will have the ability to communicate and convert themselves into finalized NEP-5 NPLAY tokens. The initial NPLAY tokens are initialized as ERC-20 to allow crowdsale participants the freedom to freely exchange the tokens if they so choose. Neoplay strongly recommends keeping the NPLAY tokens until the NEO smart contract is deployed. All NPLAY token holders (regardless of how the tokens were obtained) will then be able to convert them into their functional NEP-5 model. EPLAY tokens will be equipped to play and reroll on the Ethereum smart contract immediately without any further input from token holders.

The secure blockchain intermediary will be prompting users with ERC-20 NPLAY in their ERC-20 wallets to input their NEP-5 supported wallet address, and linking their wallet through third-party applications (e.g. MetaMask). This process is made streamlined and simple on the user end because of these applications. While these applications could be considered a point of failure, they have historically been extremely reliable. This is evidenced by the countless dApps that currently depend on these applications. Once the user has completed the steps above there will be a transaction automatically processed on the NEO blockchain crediting the user an equivalent quantity of NPLAY (NEP-5) tokens they originally had. The proceeding placeholder ERC-20 NPLAY tokens will be burned until no ERC-20 NPLAY remains. The rationale for using this method in transforming NPLAY tokens and relocating them is to give crowdsale participants the freedom to trade their NPLAY tokens just as they would EPLAY. Once the NEP-5 NPLAY tokens are credited they will be permanently on the NEO blockchain. If the incorrect address is inputted, tokens will be transferred to said address, and will, therefore, be inaccessible to the user. There is no recovery option and transformations are user-accountable. Both tokens will be credited to all crowdsale participants.

Tokens functions are proprietary and are limited to *Burn*, and *Transfer*. The limited functionality means there is very little risk in tokens becoming lost or stolen. Once minted and sold, all tokens will be under the control of the user. The only other entity with access to these functions will be a Neoplay smart contract. The smart contracts and *claim* contract will have the ability to burn tokens after receiving permission from the wallet owner/user, in the form of a wallet signature. After the deployment of the NEO smart contract, users will be able to keep their NPLAY as ERC-20 tokens, or *claim* them (recommended), completely without a central authority. The decision to *claim* the NEP-5 NPLAY tokens is at the discretion of the owner.

## Crowdsale

The Neoplay crowdsale will only credit contributions made in NEO and Ether (ETH). Those who participate in the crowdsale will be credited with both NPLAY and EPLAY tokens.

<b>Token Name</b>	NPLAY	EPLAY
<b>Ticker Symbol</b>	(NPLAY)	(EPLAY)
<b>Base Token Price</b>	10,000 NPLAY + 10,000 EPLAY = 1 ETH = 10 NEO	
<b>Early Bonus</b>	First day: +50%, First week: +40%, Second week: +25%, Third week: +15%, Final week: +5%	
<b>Start Date</b>	May 5 <sup>th</sup> , 2018, 8:00 PM UTC	
<b>Duration</b>	4 weeks (or until hard cap is reached)	
<b>Maximum Token Supply</b>	100,000,000	100,000,000
<b>Crowdsale Supply</b>	85,000,000	85,000,000
<b>Founders Reward</b>	10%	10%
<b>Founders Tokens Lock</b>	Tokens given to founders will be locked for 1 year. Investor tokens are unlocked.	
<b>Unsold Tokens Burned</b>	Yes	Yes
<b>Reroll functionality</b>	Yes	Yes
<b>Deflationary</b>	Yes	Yes
<b>Network Built For</b>	NEO	Ethereum
<b>Token Compliance</b>	ERC-20 to NEP-5	ERC-20

The crowdsale will sell both NPLAY and EPLAY tokens simultaneously. Contributions will grant an equal amount of both tokens. Assuming the base rate, a contribution of 1 ETH will grant the user 10,000 NPLAY and 10,000 EPLAY. 1 NEO will grant the user 1,000 NPLAY and 1,000 EPLAY. If a hard cap is reached then both tokens will sellout simultaneously. Tokens sold through the crowdsale will be unlocked and freely traded after the token sale is complete. No more NPLAY or EPLAY will be minted after the crowdsale. As a founder's reward, 10,000,000 of each token (NPLAY and EPLAY) will be compensated to the Neoplay Team and subsequently locked for 8,760 hours (1 year). 5,000,000 of each token will be held in reserve as a reward for our official bug bounty.

Contributions made in NEO will require contributors to sign their transactions with a digital signature including their respective ERC-20 supported wallet.

## Competing Projects

As of present, there are no comprehensive or complete NEO based dicing services on offer other than Neoplay. Existing NEO gambling projects do exist however they lack many key features integral to becoming a viable gambling platform for regular users. Some of these missing features include but are not limited to instant payouts, liquidity, ability to set odds, a

dedicated house, full anonymity, provable fairness, and intrinsic token functionality. In addition, no existing NEO or Ethereum based gambling project allows for cross-network token functionality.

**Neo Raffle** - Neo Raffle allows users to participate in a raffle on the Neo blockchain. Users send GAS and winners are chosen daily and rewarded with the total pot worth of GAS. Neo Raffle requires there to be at least two users betting. The platform does not allow for instant payouts<sup>10</sup>. Neo Raffle is limited in scope and aims to be a proof of concept of how gambling platforms could work on the NEO blockchain but ultimately doesn't have the same goals as Neoplay does.

**Lucky Neo** - Lucky Neo allows anyone to send their extra GAS to a raffle contest. One winner will be chosen every two weeks and automatically paid out. Lucky Neo uses an admin account to automatically pay out the winner to the address that sent the funds. Like Neo Raffle, Lucky Neo is also a raffle based platform. The platform is in the testing phase and offers users a more passive gambling experience with payouts happening every two weeks automatically<sup>11</sup>.

There are very few, if any, real competitors to Neoplay. The existing dicing platforms that do exist operate on other networks. Neoplay doesn't just introduce a real online gambling experience to the NEO blockchain, it innovates by allowing players more freedom of action.

## Development Roadmap

Neoplay has successfully developed and tested both tokens. Both smart contracts will be audited by 3rd parties prior to their full deployment. The Neoplay tokens NPLAY & EPLAY including their smart contracts are live on a test-net. Both smart contracts are standard in their design and relatively straightforward making them relatively safe with a very low possibility for critical bugs. All Neoplay tokens sold will be unfrozen for crowdsale participants (excluding founder's tokens).

### Roadmap

<b>Q3 2017</b>	Planning, recruiting, market research – <b>Completed</b>
<b>Q4 2017</b>	Early development, early testing – <b>Completed</b>
<b>Q1 2018</b>	Development, testing, advertising – <b>Completed</b>
<b>Q2 2018</b>	Crowdsale, auditing, Ethereum & NEO smart contract deployment – <b>In progress</b>
<b>Q3 2018</b>	Commercial partnerships, community building, new development.
<b>Q4 2018+</b>	Additional games, project development, further integration of Neoplay tokens.



## **Future Possibilities**

Neoplay will continue development of future gambling related games and projects as it grows the Neoplay platform into the future smart economy. As new NEO and Ethereum development tools are published, Neoplay can continually refine features like; bettering the provable fairness, lower barriers to entry, quicker transactions, and lower gas costs. Future gambling related games and projects built on the NEO (and Ethereum) blockchain will keep NPLAY (and EPLAY) tokens at their center to continue incentivizing the trade and use of Neoplay's native tokens. The Neoplay platform and its penetration and growth in the online gambling market will depend on the Neoplay crowdsale as well as the involving blockchain technology.

## **Disclaimer**

Neoplay and Neoplay smart contracts are dependent on NEO and Ethereum technologies.

A critical issue involving the NEO network or the Ethereum network could result in Neoplay development being significantly delayed and or suspended.

There is no surety or guarantee that smart contracts and blockchain technology involving gambling will remain legal, unregulated, or usable within your legal district.

There is no surety or guarantee that NPLAY or EPLAY tokens will increase in value or garner sufficient adoption.

This document does not constitute a prospectus. This document does not constitute an Initial Public Offering or Equity/Share offering. Fiat currency is not accepted in the Neoplay crowdsale.

NPLAY and EPLAY tokens are not in anyway related to shares in Neoplay.  
Owning NPLAY or EPLAY tokens does not constitute a share of equity or a share of ownership in the Neoplay platform.

Neoplay is not responsible for any losses that may occur, Neoplay is not responsible for possible future risks involving the NEO network or Ethereum network.

## **More Information**

Visit our [Neoplay-Crowdsale.io](http://Neoplay-Crowdsale.io) website for more information on Neoplay.  
Reach the Neoplay team via our email: [team@neoplay.io](mailto:team@neoplay.io)

- [1] <http://docs.neo.org/en-us/sc/introduction.html>
- [2] <http://ndapp.org/>
- [3] <https://icostats.com/roi-since-ico>
- [4] <https://matchcoins.info/?c1=ethereum&c2=neo>
- [5] <https://www.random.org/randomness/>
- [6] <https://www.statista.com/statistics/270728/market-volume-of-online-gaming-worldwide/>
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- [11] <https://github.com/mmoravec/luckyneo>