

# Global Risk Exchange White Paper\_EN

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Global Risk Exchange

White Paper

v1.1.2

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## 1. Executive Summary

**Global Risk Exchange** (or "GRE") is a blockchain based, decentralized global risk contract market and public chain, with the purpose of helping individuals, companies and organizations to freely hedge, transfer and trade their risks. GRE completely reconstructed traditional risk management industry(insurance and derivative markets) in a decentralized way, and will become the underlying operating system to support insurance and derivative transactions in the era of blockchain.

First of all, GRE democratize the creation of risk management tools using blockchain based smart contract and orcales, enabling any individuals and institutions who has risk management needs to create, trade and shift risks to others who are willing to take on

those risks on the blockchain. It's a platform where risk management policies and transactions are driven by real demands, where individualized and fragmented risk coverages are made possible, and insurance protections are made agile.

Secondly, GRE leverages a blockchain based decentralized exchange to help participants in the risk management contract: insured(who pay for premium and sell risks), insurer(who receive premium and take on other people's risks) and contract designer(who measures individual risks and design the contract), transact and profit from their own information and understanding of risks. The market price of the risk contract represents the market consensus and the wisdom of the crowd, which is the best measurement of the risk at the moment.

Thirdly, GRE enables a much larger base of insurance capacity providers other than traditional insurance companies and reinsurance companies, which are centralized, tightly regulated and capital intensive. Those new capacity providers can bring more liquidity and information to GRE platform and can profit from GRE by taking on various kinds of risks they understand, while making the whole risk exchange market more efficient and liquid by bringing down the entry barrier for both insured and insurer, maximizing liquidity and information flow.

GRE aims to build the blockchain infrastructure and trading platform for risk management industry in the blockchain driven world, by providing a public chain, a fundamental protocol for the creation of risk events, pricing, trading, information collection and verdict. It will enable individuals and institutions around the globe to achieve risk and return equilibrium.

## **2. Background**

### **2.1 Market Size of Global Risk Management**

Uncertainty, or risk are the one thing that human society cannot avoid throughout the history and human history are shaped by the way we recognize and manage risks and invent tools to better manage and hedge risks. For individuals, the most familiar tools to manage risks are insurance products, while sophisticated institutional investors and companies will leverage the derivative market to hedge their risks. The insurance and derivative market are the essential components in the global financial market.

Global gross premium written in 2016 amounted to 4 trillion USD and accounted for 5.7% of global GDP and the same number will approach 4.8 trillion USD in 2017. While the global derivative market size is 1500 trillion USD, compare to the global GDP at 50 trillion USD and market size of global equity and bond market at 100 trillion USD. The nominal value of global derivatives are 30 times the size of global GDP.

### **2.2 Problems in the Traditional Risk Management Market**

#### **2.2.1 Problems in the Traditional Insurance Market**

### **Centralized Product Design and Risk Pricing Leading to Product Homogenization**

Traditional insurance products are designed, actuarial priced and sold in a centralized way. The homogeneous product design could not meet the diversified risk management needs of the people; risk pricing for the insurance products are solely relied on the actuarial model and lacks more efficient measurement tools and market; sales in insurance companies are highly dependent on channels. Because of the homogeneous product design, insurance companies often carry out vicious price competition, resulting in the waste of social and financial resources.

### **High Sales Channel Cost and Low Cash Efficiency**

The traditional model of licensed insurance business relies very much on intermediary channels and a pyramidal corporate structure to maintain control, resulting in high insurance broker agencies fees and operating expenses. All those costs will result in high premium costs for customers, while small and medium-sized insurance companies suffers from low profits or even large losses due to lack of scale and huge overheads.

### **Low Operating Efficiency**

The organizational structure of insurance companies is large and bloated, its decision making mechanism cannot keep up with the ever changing market, the overall operation and innovation ability is low, and the bureaucracy is serious.

### **User Privacy Protection**

Traditional insurance sales process requires insurants to provide a large number of personal information, including ID cards and other sensitive private information, and is centrally stored in the insurance company's database, there is a relatively large risk of information leakage and insider illegal use. A lot of user's private information is acquired by internal personnel and sold for profits.

### **Misleading Policy Sales and Insurance Fraud**

In the course of insurance policy sales, insurance salespeople often deliberately conceal contract terms or even deceive policyholders. Policyholders also conceal their actual situation in order to obtain more favorable coverage ratio or lower premiums. Claim fraud also happen because of the asymmetric information between the insurance companies and policy holders.

### **Moral Hazard**

Buying insurance may change the policyholder's risk preference, resulting in behavior that some insurers do not want to see, for example, car insurance policy holders may instead be more laissez-faire and careless about their driving behavior. No practical mechanism in the traditional insurance market is in place to solve such moral hazard problem.

## **2.2.2 Problems in the Traditional Financial Derivative Market**

The global financial crisis of 2008 exposed a number of problems in derivatives markets around the world, for example, the large and uncounted size of OTC derivative market, over reliance on internal mathematical models for risk pricing and do not reflect the true trading and liquidity conditions of the market, high counterparty risk in market turmoil and the drying up of market liquidity due to extreme market panic.

## **Uncounted OTC Trading Volume and Opaque Risk Measurement**

Most of the derivatives market relies on the internal model of financial institutions to calculate book value and risk capital requirement, which leads to the serious distortion of risk measurement and hides massive risks on the balance sheet of the institutions.

## **Counter-party Risk and Credit Risk**

OTC derivative market relies heavily on counter-party's ability to fulfill its obligations and when bank run on the shadow banking system happened in 08's financial crisis, Lehman Brothers failed to meet its payment obligations and went bankrupt. Because Lehman Brothers played a central clearing role and biggest market maker in the CDS market, the whole market became a complete chaos because no one could ever make the market again.

## **Market Panic Leading to Liquidity Crunch**

When markets are in a state of panic, aversion to risk leads to the depletion of liquidity, creating a vicious circle, increasing risk exposure and increasing market volatility. The main reason for market panic is that no mechanism could make sure that the counter-party's ability to make payment and meet obligations of derivative contracts. Credit ratings became a joke at that time and legal proceedings took too long.

## **2.3 Why Blockchain and Its Advantages**

Blockchain technology leverages a sharable distributed ledger to store transaction data, issuing crypto-currency and implement intelligent contracts. Its main advantages are:

- Decentralized, transaction information written into the block cannot be tampered with, providing true and reliable information records.
- Smart contracts can be automatically executed without human intervention
- All Information is transparent and can be traceable

Blockchain technology will undoubtedly redefine insurance and financial derivatives market and become the underlying operating system for insurance and financial derivative markets in the era to come.

### **2.3.1 How Blockchain Technology Redefines Insurance**

#### **Personalized**

Everyone in the blockchain can publish personalized insurance needs, and leverages the smart contract to match corresponding insurance capacity, which leads to a truly customized insurance protection for everyone.

#### **Deconstruct Insurance Company, Improving Efficiency**

Deconstruct a traditional insurance company into three parts: sales channel, actuarial ability to design insurance contracts, and insurance capacity. For sales channels, more sales are initiated by people in need of insurance instead of selling to a group of people same product. Actuaries in insurance companies are free to publish their own products on the blockchain and let the market determine which one sells and profit from transaction fees incurred, therefore bypassing tedious internal approval process. By encouraging any funds that are capable of providing insurance capacity, any individual,

company or organizations can leverage its risk pricing ability to profit and maximizing capacity for specific risks.

#### **Privacy and Identity Protection**

Personal identification and property information is safely stored on blockchain, and ownership of sensitive information is entirely in the hands of the user. The only way to view personal information is through a smart contract of identification, and only those with private keys can authorize others to view their decrypted personal information.

#### **Token Economics Incentive Community to Contribute**

All individuals or organizations contributing to the community are rewarded with tokens based on the community's predetermined rules, thus giving the community participants enough incentive to participate and to form long-term relationships with the community.

#### **Automotive Claim execution by Smart Contract**

Claims on the insurance contract are automatically executed by smart contract according to oracle, thus excluding human intervention in the claim process. Also, all premiums and capacity are locked in the smart contract in the forms of token and tokens are distributed automatically by smart contracts, eliminating counter-party risks.

### **2.3.2 How Blockchain Technology Redefines Derivatives Market**

#### **Decentralized Order Matching and Record Keeping**

All derivative contracts are settled by blockchain with a time stamp, making it tamper proof and transparent and verifiable to all market participants.

#### **Active Market Trading to Consolidate Personal Information and Create Market Consensus of Risks**

Leveraging the liquidity of the global market to consolidate personal information and form market consensus, blockchain based risk pricing will be more accurate than internal model of financial institutions.

#### **Smart Contract Ensures Payment and Eliminates Counter-party Risk**

Every risk management contract will lock tokens provided by all market participants and will redistribute them according to final verdict by oracle, thus eliminating counter-party risk completely and avoid market panic during market turmoil.

#### **Global Market and Liquidity**

Blockchain is not bound by countries and is open to any individuals and organizations around the globe. All risks can be traded on the blockchain and leverages global liquidity by breaking down the countries barriers.

## **3. Solutions by GRE**

### **3.1 Executive Summary**

Global Risk Exchange (or “GRE”) is a blockchain based, decentralized and open global risk exchange market, with the purpose of helping individuals, companies and organizations to access and trade their risks.

Traditional insurance industry has a very long value chain, it begins with insurant, insurance agents, direct insurance, reinsurance and ends with insurance link securities(ILS) investors. But if we stripe all those roles in the value chain away and the insurance or risk management industry’s pure purpose is to match two group of people, one group of people seeks to shift risk away from them and are willing to pay premiums to those who could shoulder those risk for them. Those poeple are called ”insurant”. The other group of people are willing to take risks that other shift to them in return collect premiums for compensation. Those people are called insurer and they provide capacity for risks. When certain risk happened, insurer has to compensate the insurant with pre–determined amount of money from its capacity; if certain risk did not happen, the insurer booked premiums as their profits.

Blockchain based GRE platform will transform the essence of risk management transactions into a trading market where risk sellers and risk takers can trasact directly using blockchain technology. It compresses the elongated chains of the traditional insurance industry while minimizing thresholds, providing maximum liquidity and most accurate pricing of risks.

## **3.2 Major Characteristics of GRE**

### **3.2.1 Complete Democratization of Insurance and Risk Management Contract Design**

All individuals and organizations can meet their individualized risk management needs through the GRE platform and find appropriate risk management contracts on our platform. Ordinary users can create risk management contracts based on existing templates and insert private key encrypted personal information into that contract; professional users on the platform (actuaries or actuarial institutions) can design relatively more complex risk management contracts and gain volume based rewards from transaction fees incurred from that risk contract.

On GRE platform, the design of risk management contracts was completely democratized and is not controlled by any central regulator. The quality of the product design is entirely up the active trading market to decide. A better designed contract will attract bigger transaction size and the contract designer will receive higher transaction fee rewards. Poorly designed contracts will be marginalized for lacking of market depth and transaction volume.

### **3.2.2 Reconstruct the Insurance Value Chain and Eliminate Intermediaries**

GRE shortens the entire insurance value chain into a platform for policyholders, insurers and product designers, and strives to achieve balanced allocation of risks among market participants through active traded market. At the same time, it also eliminates information asymmetries and agency costs in the traditional value chain and maximizes order matching efficiency.

### **3.2.3 Market Based Risk Accessment and Pricing**

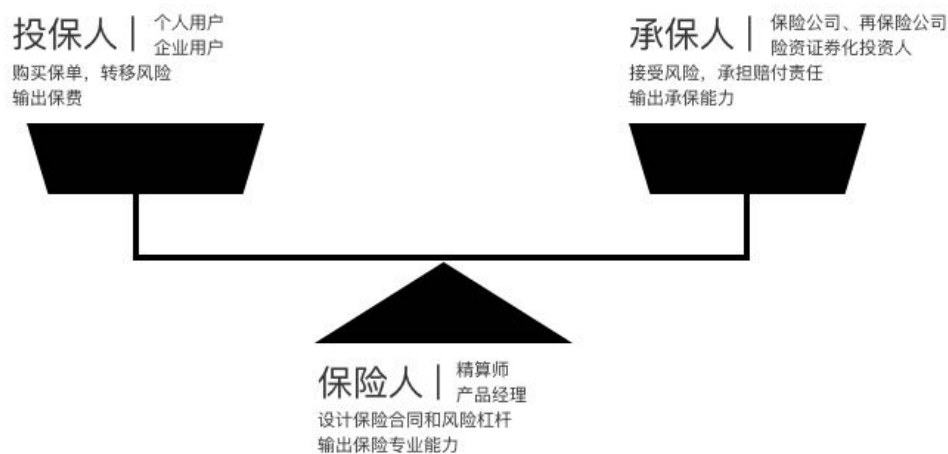
The GRE platform leverages a decentralized order matching engine to facilitate risk management contracts. It is the most efficient means of pooling private information of all market participants. All individuals or organizations with private information about a specific risk can trade that risk through the GRE platform seeking to profit its private information. The real-time market price of specific risk on GRE platform is the best pricing for that risk at that moment.

### 3.2.4 Smart Contract Ensures Payment and Eliminates Counter-party Risk

Every risk management contract will lock tokens provided by all market participants and will redistribute them according to final verdict by oracle, thus eliminating counter-party risk completely and avoid market panic during market turmoil.

## 3.3 GRE Ecosystem

In GRE ecosystem, there are 5 roles, namely underwriter, insured, insurer, GRE platform and block producers.



### 3.3.1 Contract Designer

Underwriters in GRE ecosystem could be the actuary or product manager of a real-world insurance company, who is responsible for designing terms of risk management contracts, as well as calculating the probability of various kinds of risks and its corresponding premium rate. The role of underwriter is to provide insurance expertise to GRE, which can be any individual or institution with actuarial capability. Underwriters will be rewarded a portion of the transaction fees derived from own risk management contract after community review.

### 3.3.2 The Insured

This group of users in GRE are the individuals and institutions in the real world who want to buy risk management contract to hedge their risks. They shift their own risks away to others who are willing to take them at the cost of premiums and will be compensated when that risk actually happens.



### **3.3.3 Insurer**

Insurers in GRE ecosystem can be real-world insurance companies, reinsurers and ILS investors. They accept the risks transferred by the insured, assume the risks passed on by the insured, and pay the corresponding liabilities when the risks occur. They provide their insurance capacity to GRE platform and are rewarded with a portion of transaction fees for providing insurance capacity and liquidity to the system.

### **3.3.4 GRE Platform**

The GRE platform charges a certain fee for each risk management transaction and injects it into the foundation development fund for subsequent platform development and maintenance.

The GRE Foundation is an independent body with the main responsibility are:

- Supporting the technical development of the GRE blockchain platform, selecting and introducing major partners and actively developing the GRE community
- GRE Foundation will be responsible for community development, incentives design, legal affairs and compliance
- Responsible for the design of the smart contract, allow community developers to submit the code changes and bugs, establishing a fair and reasonable evaluation mechanism

### **3.3.5 Block Producers / Witnesses**

In the GRE platform, the block producer / witness's job is to collect all the risk transactions within a period of time, package the transaction into the block, sign the block with private key and broadcast to the whole network. They will also report the result of all risk events occurring within a block time according to oracles, and pack those results into the block, sign and broadcast to the entire network.

## **3.4 Token Economics in GRE: RISK**

In GRE platform we use RISK token as transaction intermediary, a Ethereum smart contract based and ERC20 standard compliant token. RISK token can be acquired using BTC or ETH and other crypto currencies. RISK is a utility token in GRE platform and can be used for:

1. All risk management contract use RISK as transaction intermediary and all risk contract claim distribution will use RISK for settlement;
2. Users on GRE platform should buy RISK tokens to pay for transactions fees;
3. Any institutions and individuals could publish risk management contracts using GRE platform and will get volume based rewards in RISK tokens;
4. GRE community will reward developers with RISK tokens in light of their code contributions;
5. Any individuals and institutions can share risk management contracts in their social networks and attract more users to trade those contracts. They will be rewarded a portion of new transaction fees derived from those newly traded contracts;
6. GRE platform allows exchange dealers use RISK tokens as collaterals to issue market pegged stable coins; similar to BITCNY and BITUSD on Bitshares platform.

### 3.5 Reference Database of Hazard Identification (RDHI)

Reference Database of Hazard Identification (RDHI) is a data base of risk events maintained by GRE founding team and community members, which defines the very basic and standard elements of a risk management contract. Users could use the RDHI editors on GRE platform to create from scratch or to leverage existing RDHI templates or to create new risk events. RDHI is comprised of a series of Hazard Identifications (HI) and each HI contains the below elements:

- Title: The name of risk event and made easier for search
- Description: decription of the risk event
- Category: what kinds of risk it is and make it easier for search
- Hazard Template: What elements should be put in
- Verification: A trustworthy or stable data source for verification(centralized database or decentralized verification using consensus) and oracles to identify risk events results
- Result: could be Binary, Numeric, String, List, Range and in XML format files

All GRE users could make suggestions to new HIs and use HI Editors to upload new HI Candidates. At the same time, they should also give stable, timely and verifiable data source or oracles.

事件名称 Hazard Title	<input type="text" value="中国城市天气数据"/>
事件描述 Hazard Description	<input type="text" value="本站天气预报目前可以查询涵盖 34 个省、市所属的 2290 个城市、县、地区天气历史记录, 主要指标包括每天最高气温、最低气温、天气状况、风向等。"/>
事件类型 Hazard Category	<input type="text" value="自然风险"/> <input type="text" value="天气气象"/>
参数模板 Hazard Template	选择地区: <input type="text" value="上海市"/> <input type="text" value="上海市"/> <input type="text" value="静安区"/> 选择日期: <input type="text" value="2018-02-14"/>
结果验证 Result Verification	<input type="text" value="http://www.nmc.gov.cn/publish/nwpc/grapes_gfs/nh/200hPa-hgt.htm"/>
风险结果 Hazard Result	<input type="text" value="降水量"/>

#### Create HI Candidate

Every HI Candidate submitted will be reviewed by GRE team or volunteers and contributors who has passed the review process will be reward by RISK tokens. The review process will adopt DPOS and community users could choose to vote using their own RISK or delegate their tokens to agents to vote for them.

The review process will consider the following angels:

- The risk event does not involve illegal or terrorism;
- Risk events should conform to the principle of proximity cause of insurance, each risk event should and should only include one single risk and to avoid double or multiple risks such as "rain caused flight delays". Please specify the "rain" and "flight delays" as separate HI;
- The risk event conforms to the principle of insurance ejection, that is, an event with an objective and reasonable probability and avoid events such as "I am in bad mood" or "2>1";
- HI should conform to common order and social customs.

### 3.6 Setting Up Risk Management Contracts

RDHI is open to all GRE users, supports both category search and keyword search.

The screenshot shows the RDHI search interface. It has two search methods: '类别搜索' (Search by Category) and '关键词搜索' (Search by Keywords). The category search dropdowns show options like '自然事件', '社会事件', '个人健康', '财产安全', '企业事件', '金融资产', '政治军事', '经济金融', '科学技术', '文化娱乐', '体育赛事', and '汽车房产'. Below the search options is a table of results.

风险事件库	生成保单数	用户评价	
<b>国际赛事</b> 奥运会、亚运会、国际主要锦标赛和杯赛事件数据源。	132	☆☆☆	生成保单
<b>2018世界杯官方RSS</b> 围绕2018世界杯赛场内外的最权威、及时的数据源。	89	☆☆☆☆	生成保单

### Search Hazard Identification

All the users have the right to choose a HI template and create risk management contracts. Please put the following contract elements into consideration:

- **Due Date:** Users need to set a due date for risk management contracts. GRE platform will execute the risk management contract automatically and distribute claims automatically when the contract dues.
- **Risk Capital Pool:** The sum of the locked premiums and capacity in a risk management contract by GRE smart contract.
- **Premium Rates and Odds:** The risk management contract requires an pre-determined premium rate to calculate the contract odds, the premium rate is usually stipulated based on the risk capital pool as 1.00 (or 100%). For instance, if the premium rate is 0.25/25%, it means that the insured needs to provide 25% of the risk capital pool as premium, while the insurer needs to provide 75% of it as capacity. The insured's odds are 1:0.25=4:1, and the insurer's odds are 1:0.75=1.33:1.
- The design of the contract should conform to the principle of insurable interest and insurance compensation. The user should consciously commit that the insurance interest is real and the insurance compensation should not exceed the actual loss.

合同名称  
Policy Title

天气险 (上海市静安区2018-02-14不下雨)

满期时间  
Policy Expiration

2018-02-15 00:00:0000

风险事件  
Hazard Identification

中国城市天气数据 [\[更改\]](#)

风险模板  
Hazard Template

选择地区:

上海市 上海市 静安区

选择日期:

2018-02-14

保费费率  
Premium Rate

0.25 GRE Token

我同意并自觉遵守用户协议。

提交

## Create Insurance Policy

The contract can be set to "open" or "private". When set to "private", the contract is visible only via exclusive links. The contract link can be shared on social media. A user who creates a risk management contract will be rewarded, and the reward will be proportional to the fees generated by that contract.

### 3.7 Risk Management Contract Transaction

#### 3.7.1 Paying Premium and Buying Capacity

There are two ways to trade the risk management contract: paying premium and buying capacity. Users chooses to pay premium when they have risks that they want to hedge and when that risk actually happens in the future, they will receive the claim to cover their losses; users can also choose to buy capacity, if the risk does not happen before the expiration of the contract, users will receive the premiums.



#### 3.7.2 Types of Tokens Eligible for Transaction

GRE encourages users to transact risk management contracts using RISK token. However, with the growth of our community, there will be users who do not want to assume the risk of RISK's price movement. They want to anchor the profits to

fiat currency so that they could precisely hedge their potential losses in real world. Therefore, GRE platform will introduce the exchange dealers for fiat money to meet that need. Exchange dealers could issue equivalent amount of **Fiat-Pegged Token (FPT)** on GRE for fiat money they received from users. This mechanism is similar to the relationship between BTS and BITCNY or BITUSD on the Bitshares platform. The user may use fiat-pegged token on the GRE platform to enter into any risk management contracts.

Exchange dealers have to lock up certain amount of RISK using smart contract of GRE to ensure future cash withdraw and the market value of locked RISK tokens must exceed the issued fiat-pegged token. GRE platform will publish in real time of all the fiat-pegged tokens and their corresponding collaterals. When the market value of RISK token goes down, exchange dealers should lock in more RISK tokens as collateral to avoid forced closure(the system automatically sell locked RISK tokens to ensure payment of fiat withdraw).

Users could also buy and sell fiat-pegged tokens issued by exchange dealers in GRE platform, instead of recharging and withdrawing from exchange dealers.

### **3.7.3 Transaction Fees**

To improve liquidity and encourage providing more capacity on GRE platform, GRE introduces "maker-taker" mechanism, the insured need to pay a certain amount of transaction fee, and the insurer will be rewarded a certain proportion of the transaction fees for providing insurance capacity. All transaction fees need to be paid by RISK and all users (including those using fiat-pegged tokens) need certain amount of RISK tokens in their accounts to pay for GRE transaction fee.

### **3.7.4 Order Matching Logic of Risk Contract Trading**

On the GRE primary market, capacities in the same risk event, GRE's matching engine will match the insurer's capacity which provides highest odds for insured first and then match the capacity with second highest odds and so on. All matched premiums and capacities will be locked on GRE smart contract.

On the GRE secondary market, the order matching logic is similar to stock market.

### **3.7.5 Share Contracts and Earn Transaction Incentive Fee**

Any user(insured or insurers) can share their contracts with other users through social networks and receive a bonus incentive fee from the contract transaction fees generated by their invited users.

## **3.8 Contract Due and Settlement**

When the contract expires, the smart contract will execute automatically, and the result of the contract will be made known to all participated parties.

### 天气险（上海市静安区2018-02-14不下雨）



## 3.9 Secondary Market of Risk Management Contract

GRE will open a secondary market for risk management contracts, allowing contracts to be transferred to other users before expiration. The very existence of secondary market make it possible for insured with similar risk hedge needs and insurer with similar risk pricing capabilities to trade specific risk in one market. The market price is the equilibrium price of that risk at this moment and gives price reference for the primary market as well.

产品	满期日	原价	叫价	容量					
天气险（上海市静安区2018-02-14不下雨）	2018-02-14	0.25	0.28	2121	-	1	+	GRE Token	交易
信用违约险（某视供应商采购款）	2018-03-03	0.6	0.12	29214	-	1	+	GRE Token	交易
天气指数险（甘肃省2018年1季度降水量低于200mm）	2018-04-01	0.4	0.37	4021	-	1	+	GRE Token	交易
巨灾险（海南省地震不超过7级）	2018-12-31	0.68	0.28	22231	-	1	+	GRE Token	交易
货运责任险（某机场公司）	2018-01-28	0.12	0.45	19832	-	1	+	GRE Token	交易

Users can review and enter into all the unexpired contracts available in the secondary market. The ownership and all future income will be transferred accordingly.

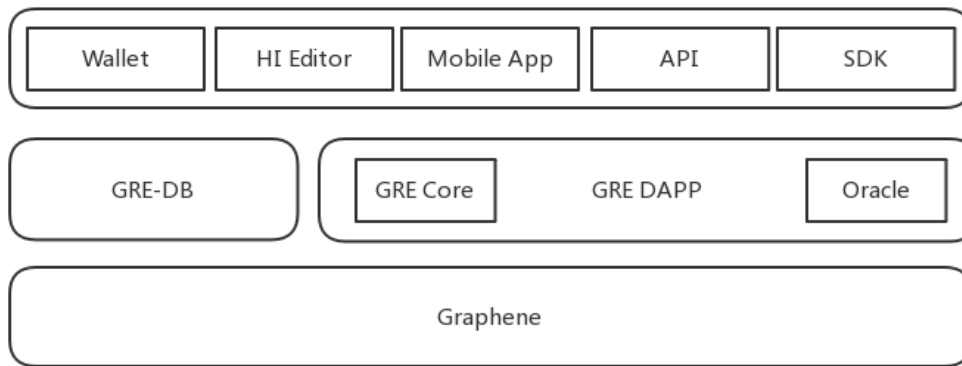
## 3.10 Comments and Assessment System

All users can comment on all those contracts they have traded, and those comments will ultimately form a system to assess contract underwriters, support and optimize DPOS system.

## 4. GRE System Architecture

GRE is a decentralized, open-source global risk exchange and the platform is built on Graphene blockchain library.

### GRE System Architecture



## 4.1 Core Components

### 4.1.1 Graphene Blockchain Library

Graphene blockchain library is a blockchain tool kit developed by Cryptonomex, the core development team of Bitshares, and is featured with high concurrency capacity and quick block confirmation time compared to Bitcoin and Ethereum. The Graphene tool kit is widely used among trading applications on blockchain. GRE will use Graphene as the underlying blockchain component, using the DPoS consensus mechanism to ensure the efficiency and stability in GRE systems and community.

### 4.1.2 GRE Core

GRE Core is a set of data, storage, presentation, matchmaking mechanisms, claims methods, and related codes for risk, insurance, and financial derivatives. GRE Core will implement the generation, preservation, transaction, claims and other functionalities for GRE platform. . It is the very foundation of GRE ecosystem.

### 4.1.3 GRE Application and Website

GRE will provide a user interface compatible with mobile and web environments.

### 4.1.4 Oracle for Hazard Identification

Firstly, we will construct a centralized oracle for data source, which inherently integrate data APIs for major risk events (crypto prices, weather, commodity price, index and etc.). Users can also assign data source(URL) and parse rules (JSON/XML/HTML) while creating risk events, which will automatically crawl and parse data source and incorporate its results into blockchain. Besides, Oracle can also provide certification for authenticity (Prove the result generated by accessing web page is authentic instead of made-ups via TLSNotary. Technical details can be found at: <https://tlsnotary.org/TLSNotary.pdf>). Finally, after Oracle comes up with a conclusion, sufficient time is provided for users to raise any objections, and human intervention will be needed if necessary.

The second step is to build a Oracle based on voting results which rewards the data source giving correct answers and build a dispute settlement mechanism using DPoS.

#### **4.1.5 Distributed Database**

Our distributed database will store private information of users, including personal ID, data needed to price individualized risks and other sensitive information. The realization of distributed database could refer to Steem (An incentivized, blockchain-based, public content platform).

#### **4.1.6 API and SDK**

Based on blockchain technology and distributed database, GRE will provide blockchain based smart contract and token economics to match and clear risk management contracts with API and SDK, which would help all participants in GRE ecosystem to easily integrate GRE into their current system.

### **4.2 Features of GRE**

#### **4.2.1 High Performance**

Built on Graphene tool kit, GRE could reach an average of 1.5 second block confirmation time and 100,000 transactions per second(TPS). It is comparable to the transaction processing speed of a traditional centralized network.

#### **4.2.2 All-platform**

Supporting not only PC and mobile, but also API and SDK to meet the needs of different types of users.

#### **4.2.3 High Efficiency**

GRE improved the efficiency of all parts in traditional insurance value chain through Oracle and API and reduced the intermediary cost at the same time.

#### **4.2.4 Individualized**

Based on the community-managed, continued expanding database of RDHI, users can customize risk contracts to suit their individual needs, and also trade risks in derivatives market, which will further increase their risk management capability.

### **4.3 Long-term Development Plan**

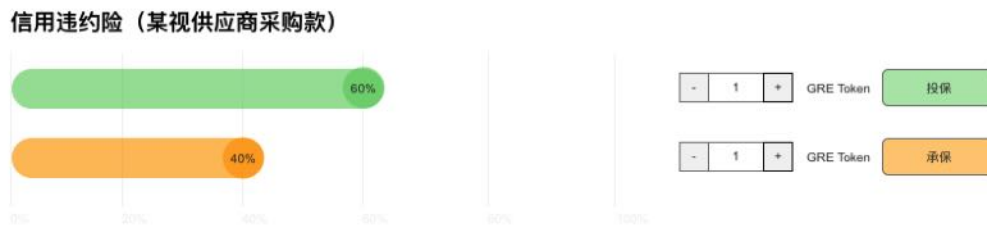
After finish developing the risk management contract trading functions, GRE will focus on the development of derivatives market, providing users with functions such as real-world policy pledge, secondary contract trading and so on.

## **6. Use Cases**

### **6.1 Personalized Contract Design**



Steve is a supplier of a big TV maker and the buyer is always late on payment. Also recent market rumors make him even more worried about account receivable risks of that buyer. Steve knows about GRE and submitted a need to hedge its receivable risks. After three days, the risk contract was listed on GRE and he quickly bought the contract and hedged his risks.



## 6.2 Liberalize Actuaries

Victor is an actuary he has been following that TV company closely. After he learned about the need from Steve on GRE, he delved into the financials and legal risks of that TV maker and established a detailed risk assessment model. Finally, his model was written into GRE platform and launched the credit default contract.

Compared to the over-half-year product development cycle where his insurance company will normally spend, as an actuary, Victor felt so much enjoyable creating a insurance solution to a huge social problem via GRE platform. Meanwhile, based on the reward mechanism of GRE community, Victor would be rewarded with a certain amount of RISK based on the fees generated from trading contracts that he created, which would be even more attractive than the incentive mechanism in his own insurance company.

## 6.3 Providing Capacity as Investment

Monica is a big fan and supporter of the TV company and is very optimistic about the company's future prospects. After seeing this company's credit default risk contract on GRE platform, she strongly feels it is a potential investment opportunity for her as a supporter. She chooses to provide capacity for that risk management contract, and if the company does pay back the receivables on time before the contract expired, Monica not only receives the joy of being a fan, but also receives premiums from the insured as investment returns.



## 6.4 Risk Hedging for Real-world Assets

John is a financial journalist and is also a stockholder of that TV maker. After seeing a credit default risk contract on the GRE platform, he decides to buy it to hedge against the TV maker stock he is holding, hoping to hedge parts of the losses if the company's share price plagues when its credit deteriorates in the future and defaults on its receivables.

## 6.5 Secondary Market for Risk Management Contract Trading

Three months later, news of the company's chairman returning back from US attracted lots of attention and changed some people's perceptions about the company's risk profile. Steve was optimistic that the company will be able to meet its obligations, but at the same time, he thought the risk contract he bought would lose its value completely if the TV maker fulfills its obligations, so he decided to sell the contract at 20% of initial premium in the GRE secondary market before it expires.

John analyzed the news and believed that the legal risk of this company is greater than its financial risk, and continued to take a firm view that the TV company will not be able to make its payment even if its chairman came back from US. John saw Steve's contract for sale in the GRE secondary market and bought it without hesitation expecting to profit using a greater leverage.

产品	满期日	原价	叫价	容量					
天气险 (上海市静安区2018-02-14不下雨)	2018-02-14	0.25	0.28	2121	-	1	+	GRE Token	交易
信用违约险 (某视供应商采购款)	2018-03-03	0.6	0.12	29214	-	1	+	GRE Token	交易
天气指数险 (甘肃省2018年1季度降水量低于200mm)	2018-04-01	0.4	0.37	4021	-	1	+	GRE Token	交易
巨灾险 (海南省地震不超过7级)	2018-12-31	0.68	0.28	22231	-	1	+	GRE Token	交易
货运责任险 (某搬场公司)	2018-01-28	0.12	0.45	19832	-	1	+	GRE Token	交易

## 7. Legal Structures and Disclaimers

### 7.1 Legal Structure of GRE

GRE Foundation Limited is a limited liability company incorporated in Hong Kong and is in charge of GRE platform's operation. The GRE Foundation Limited will act as an independent legal entity, fully responsible for organizing teams and cultivating an active developer community to develop distributed risk trading platform and applications. However, the operation and use of GRE completely rely on community autonomy, the GRE Foundation Limited only serves as an ordinary member in the community, proposes advices and plans for GRE's governance, but does not have the privilege or superiority over other community members.

GRE Foundation Limited will sell RISK tokens that are designed to run and use on the GRE platform in a private placement. These tokens are payment methods and settlement units for GRE's services. Once sold, no entity has any obligations to buy or redeem RISK tokens. RISK is a virtual commodity with practical uses and is neither a securities nor a speculative investment tool. The GRE Foundation Limited does not guarantee any intrinsic value or returns of RISK. RISK does not represent any real-world

assets or rights (such as the GRE Foundation Limited's shares, voting rights, and etc.). The typical audience for GRE are experts who are familiar with crypto currencies and blockchain systems.

Any permanent resident or green card holders of PRC and U.S., will not be allowed to participate in the public sale of GRE, and GRE Foundation Limited will not sell RISK to the aforementioned.

The proceeds from RISK sales will be unconditionally used by the GRE Foundation Limited and will be used primarily for technology development, marketing, legal compliance, financial audits, and business cooperation, etc.

GRE's risk contract trading market is a fully distributed platform based on Graphene and any person around the world can use its function by consuming RISKS, regardless of his or her geographic location. The GRE platform does not have a physical entity, it does not have any relationship with any jurisdictions. Even so, GRE is still likely to be questioned and regulated by regulatory authorities in different countries around the world. In order to comply with local laws and regulations, the GRE platform may not provide normal services in some areas. The GRE Foundation Limited and its team will take effort to obtain a "sandbox policy" or safe harbor to provide users with the best possible service.

## **7.2 Disclaimers**

Except otherwise stated in this white paper, the GRE foundation does not make any statements or guarantees for GRE or RISK. Anybody who participates in the RISK's selling campaign and the purchase of RISK is based on its own knowledge of GRE, RISK tokens and the information of this white paper. Without damaging the universality of the foregoing content, all participants will accept GRE according to the current situation after the start of GRE project, regardless of its specifications, parameters, performance or functions.

The GRE foundation specifically does not recognize and refuses to assume the following responsibilities here:

1. Anyone violates the anti-money laundering, counter-terrorism financing or other regulatory requirements of any country when purchasing RISK;
2. Anyone violates any statement, warranty, obligation, promise or other requirement stipulated in this white paper, and results in payment failure or failure to extract RISK when purchasing RISK;
3. For any reason RISK's selling plan is abandoned;
4. The failure or abandonment of the development of GRE platform, and resulting in failure to deliver RISK;
5. Delays in development of GRE, and resulting in failure to meet the proposed delivery date;
6. Errors, flaws, defects, or other problems in GRE's source code;
7. Failure, collapse, paralysis, rollback or hard fork of GRE platform or blockchain;
8. GRE or RISK's failure to implement any specific functions or is not suitable for any specific use;
9. The use of funds raised from token sale;

10. Failure to disclose information on the development of GRE in a timely and complete manner;
11. Any participant leaks, loses, or damages the private key of the crypto currency (especially the private key of the RISK purse in use);
12. RISK's third party selling platform's breach, violation, infringement, collapse, paralysis, termination or suspension of service, fraud, misoperation, misconduct, default, negligence, bankruptcy, liquidation, dissolution or closure.
13. Any person's trading or speculation of RISK;
14. The listing or delisting of RISK on any exchange;
15. RISK is classified by any government, quasi government agencies, competent authorities or public institutions as a currency, securities, commercial bills, negotiable instruments, investment products or other things, so that RISK is prohibited, supervised or restricted by law;
16. Any risk factors disclosed in the white paper, as well as those related to the risk factors, causing damages, losses, claims, liabilities, penalties, costs or other negative effects.

### **7.3 Risk Warning**

The GRE Foundation believes there are numerous risks during the development, maintenance, and operation of GRE, many of which are beyond the control of the GRE Foundation. In addition to the other content described in this white paper, each RISK purchaser should carefully review, understand, and carefully consider the following risks before deciding whether to participate in this token sale plan.

Every RISK buyer should pay special attention to the fact that: although the GRE Foundation was established in Hong Kong, both GRE platform and RISK exist only in the cyber virtual space, do not have any tangible presence, and therefore do not belong to or involve in any specific country. Participation in this token sale plan should be a well-thought-out decision-making action, and will be regarded as the buyer has fully known and agreed to accept the following risks.

1. Termination of the token sale plan: This RISK token sale may be terminated prematurely, in which case the purchaser may only be partially refunded the amount paid due to the price fluctuation of Bitcoin / Ethercoin and the expenditures of the GRE Foundation.
2. Insufficient information disclosure: Till the publication date of this white paper, GRE is still in the development phase, and its design concepts, consensus mechanisms, algorithms, code, and other technical details and parameters may be updated and changed. Although this white paper contains the latest key information of GRE, it is not absolutely complete and will be adjusted and updated by the GRE foundation for specific purposes. The GRE Foundation Limited does not have the ability and obligation to keep participants informed of every detail of the GRE development (including its progress and expected milestones, whether delayed or not), therefore, we do not have the ability to give purchasers timely and adequate access to the information generated from the GRE development process. Insufficient information disclosure is inevitable and reasonable.
3. Regulations: Crypto currencies are being, or may be regulated by regulators in various countries. The GRE Foundation Limited may receive inquiries, notices,

warnings, orders or rulings from one or more regulators, and may even be ordered to suspend or terminate any related token sale plans, GRE platform development or RISK trading, the development, marketing, advertising or other aspects of GRE, which may be seriously affect, hinder or even terminate this token sale as a result. As regulatory policies may change at any time, the existing regulatory permission or tolerance for GRE or the token sale may be temporary in any country. In different countries, RISK may be defined as virtual goods, digital assets or even securities or currencies, so RISK may be prohibited from trading or holding in some countries according to local regulations.

4. **Cryptography:** Cryptography is constantly evolving and cannot guarantee absolute security at all times. Advances in cryptography (such as password cracking) or technological advances (such as the invention of quantum computers) may pose a threat to cryptography-based systems (including GRE). This can result in the theft, disappearance, destruction, or devaluation of RISKS held by anyone. Within reasonable bounds, the GRE Foundation will take preventive or remedial measures to adapt to any advances in cryptography by upgrading the underlying tech agreement of GRE or introducing new security measures. The future of cryptography and security innovation cannot be predicted, the GRE Foundation Limited will do its best to accommodate itself to the cryptography and changing security environment.
5. **Development failed or abandoned:** GRE is still in the development phase and is not a mature product that is ready to be released at any time. Due to the technical complexity of the GRE system, the GRE Foundation Limited may face unpredictable or insurmountable difficulties from time to time. Therefore, the development of GRE may fail or be abandoned at any time (for example due to lack of funding) for any reason. Failure or abandon to develop will result in RISK being unable to deliver to any purchaser in this token sale plan.
6. **Stolen Funds:** There may be someone attempts to steal funds obtained from the token sale (including those that have been converted into fiat currency). These theft attempts may affect the ability of the GRE Foundation Limited to fund GRE's development. Although the GRE Foundation will adopt the most advanced technology to protect the security of its funds, some network thefts are still difficult to prevent.
7. **Source code flaws.** No one can guarantee the GRE source code is completely flawless. There may be flaws, errors, bugs, and vulnerabilities in codes that may make it impossible to use specific functions, expose users' information or other problems. If such flaws do exist, the availability, stability, and/or security of GRE will be affected, and the RISK value will be adversely affected. The open source code is based on transparency to facilitate identification and problem resolution of code originating from the community. The GRE Foundation Limited will collaborate with the GRE community to continually optimize, and improve the GRE source code.
8. **Public, distributed and autonomous ledgers:** There are three types of distributed ledgers: public ledgers, federated ledgers and private ledgers. The GRE's underlying distributed ledger is a public ledger that allows access without permission, which means everyone can freely access and use it without any restrictions. Although the GRE public ledger was originally developed by the GRE Foundation Limited, it is not owned, operated or controlled by the GRE Foundation Limited. The GRE community is fully open, decentralized and accessible, and is consists of users, fans, developers, RISK token holders, and other participants, most of whom are not affiliated with the GRE Foundation Limited. In terms of the maintenance, governance

and even evolution of the GRE, the community will be decentralized and highly autonomous. Despite the GRE Foundation Limited has previously contributed to the birth of GRE, it is just an active member of the community that is equal to any other users and does not have any privilege or superiority. Therefore, GRE Foundation Limited would not be able to govern how GRE will evolve.

9. Source code upgrades. The GRE source code is open and may be upgraded, modified or changed by any member of the GRE community. No one can anticipate or guarantee the exact result of an upgrade, modification or change. Therefore, any upgrade, modification or change may result in unpredictable or unexpected results, which may take significant adverse effects on the operation of the GRE or the value of the RISK.
10. Security weaknesses. The GRE blockchain is based on open source software and is a public ledger. Although the GRE Foundation Limited strives to keep the GRE system safe, it is possible for anyone, intentionally or unintentionally, to bring weaknesses into the GRE core infrastructure, these weaknesses cannot be prevented or remedied by the security measures adopted by the GRE Foundation Limited. This may ultimately result in the loss of RISK or other crypto currencies.
11. "Distributed Denial of Service" or DDoS attack: Graphene blockchain tools are designed as a public ledger, so Graphene may suffer from "Distributed Denial of Service" attacks sometimes. This attack may make the GRE system stagnated or paralysed, and as a result, transactions on GRE system will be delayed or even temporarily suspended.
12. Insufficient block processing capacity: The rapid development of GRE will be accompanied by a sharp increase in transaction volume and demand for high processing capacity. If the demand for processing power exceeds the GRE blockchain's maximum load, the GRE network may paralyse and/or stagnate, and errors such as "double spending" may occur. In the worst case, RISKS held by anyone may be lost, and even trigger the reversal or even fork of the GRE blockchain. The aftermath of these events will affect the usability, stability and security of the GRE and the value of RISK.
13. Unauthorized claim for RISK: Any person who obtains the buyer's registered email or account by decrypting the RISK buyer's password will be able to obtain RISKS in their accounts. Based on this, these RISKS may be mistakenly sent to anyone who claims RISK through the purchaser's registered email or account, this is an irrevocable and irreversible delivery. Here are some tips for each RISK purchaser to properly keep the registered email or account safe: (i) use a high security password; (ii) not open or reply to any fraudulent email; and (iii) strictly protect its confidentiality or your personal information.
14. Private key of RISK wallet: The loss or destruction of a private key is irreversible. Only the local or online RISK wallet has the unique public key and private key to control RISK. Every purchaser shall properly keep their private keys of the RISK wallet, the GRE Foundation Limited or any other person are not responsible for the key lost or damages.
15. Popularity: The value of RISK depends heavily on the popularity of GRE platform. GRE is not expected to become popular or widely used very soon after releasing. In the worst case, GRE may even be marginalized for a long time, attracting only a small number of users. A large proportion of RISK demand may be speculative. Lack of users can lead to price volatility in RISK market and may influence the GRE long-term development. In the event of such price volatility, the GRE Foundation will not

(or do not have the responsibility to) stabilize or intervene the market prices of RISK.

16. Liquidity: RISK is neither a currency issued by any individual, entity, central bank or state, supranational or quasi-state organization nor is supported by any hard assets or other credit. The circulation and trading of RISK is not the responsibility or goal of the GRE Foundation Limited. RISK trading activities are based solely on the consensus of market participants. Nobody is obligated to redeem or purchase any RISK from the RISK holder, neither is anyone able to guarantee the RISK or market price to any extent at any time. If RISK holders want to transfer RISK tokens, they need to find one or more buyers who intend to purchase at an agreed price. This process might be costly, time-consuming, and unsuccessful in the end. Additionally, there may be no encrypted token exchange or other market for RISK to be traded.
17. Price fluctuations: When traded on an open market, the price of cryptocurrency usually fluctuates sharply. This price volatility may be caused by market forces (including speculation), policy changes, technological innovations, the availability of exchanges and other objective factors, which also reflect changes in the balance of supply and demand. The GRE Foundation Limited is not responsible for RISK trading in any secondary markets, whether or not there is a secondary market exists. Therefore, the GRE Foundation Limited has no obligation to stabilize the price fluctuation also do not concern about it. The risk in RISK prices should be shouldered by RISK traders themselves.
18. Competition: The GRE underlying protocol is based on open source computer software. No one holds the copyright or other intellectual property rights to the source code. Therefore, anyone can legally use the GRE source code and/or underlying protocols to try to develop competitive protocols, software, systems, virtual platforms, or virtual machines, every individual or institute can copy, reproduce, design, modify, upgrade, improve, record, reprogram them, and then compete with GRE, even to overtake or replace GRE. The GRE Foundation Limited has no control over this. In addition, there are and will be many competing blockchain-based platforms competing with GRE, under no circumstances will the GRE Foundation eliminate, prevent, restrict or reduce such efforts to compete with or replace the GRE.

## **8. Development Plans and Roadmap**

### **2018 Q1**

1. GRE-Core development
2. Centralized Oracle development
3. Demo of GRE App development
4. Demo version of App-server development

### **2018 Q2**

1. HI editor development

2. Mobile wallet development
3. Official App development
4. Continue GRE-Core and Oracle development

## **2018 Q3**

1. Development of Alpha Edition
2. Provide API & SDK
3. Security audit
4. GRE test running

## **2018 Q4**

1. Basic RDHI library content production
2. KYC related development
3. Security audit
4. Complete migration to public chain
5. Formal operation of the GRE primary market

## **2019 Q1**

1. Development of secondary market editor
2. Content production of secondary market base
3. Secondary market security audit
4. Complete development of the Alpha version of secondary market

## **9. Team, Advisors and Investors**

### **9.1 Team**

#### **Paul Qi**

Actuarial master of Boston University, has worked for many years in the United States as actuary. Founder and CEO of OK auto insurance and has extensive influence in the global insurance technology circle.

#### **Charles Huang**

Morgan Stanley Asia Pacific Investment banking sector TMT industry analyst, investment professional at IDG Capital fintech team, fintech and enterprise service entrepreneurs.

#### **William Jin**

Senior architecture & technical leader at Shanda and Co-founder and CTO of OK auto insurance.

#### **Angela Li**



Master of Finance at Fudan University and has 3 years investment experience in start-ups focusing on fintech and healthcare.

### **Mara Wang**

International MBA at NEOMA Business School. Experienced director of marketing and public relations with a demonstrated history of working in global Fintech industry. Previously worked as director of marketing and PR at InsurBox Tech, a leading insurtech start-up in China, and a leading futures trading broker in China.

## **9.2 Advisors**

### **Alberto Pedro Gabriel**



Chairman of GRE Foundation, chairman of Argentina's leading local life insurance company CRUZ SUIZA COMPA IA DE SEGUROS S.A. and has three insurance broker licenses in Argentina, Brazil and Uruguay.

### **Frank Desvignes**



Founder and CEO of AXA Asia Research Institute.

### **Lorand Heissmann**



Operation director at Allianz Insurance China.

### **Kazy Hata**



CEO of justinCase, a Japanese insurance start-up, used to work at Milliman and Munich Re, Japan as actuary.

### **Li Jun**



CEO of Yibite, Principal Investigator of 01caijing, early researcher and investor of Bitcoin, published several books on cryptocurrency.

## **9.3 Investors**

### **Shen Bo**



Founder of Fenbushi Capital and co-founder of Bitshares.

### **James Gong**



Founder of ICOAGE (used to be the largest ICO platform in China) and Blockchain Pencil and published several books on crypto currency.

### **LD Capital**



LD Capital was founded by famous blockchain investor Lihua Yi and is a renowned institutional investor in blockchain industry in China. LD Capital has strong industry insight and resources and research team and has successfully invested: BTC, ETH, Qtum, Vechain, EOS, GXS, Achain, Beechat, ELF, Ulord and other more than 100 blockchain start-ups and earned more 100x in returns.

### **Crypto Venture**



Crypto Venture Capital serves and invests hundreds of block chain-based projects, and have gotten Angel investment from JRR Capital.

## **10. RISK Token**

### **10.1 Generation of RISK**

Initially, GRE will generate a total of 10 billion (10,000,000,000) RISK tokens based on Ethereum ERC20 standard. GRE Foundation will be considered as the initiator of all RISK tokens. Users could acquire RISK through airdrop and crypto currency exchanges after RISK is released.

### **10.2 Usage of RISK**

RISK is a utility token which may only be used on GRE platform for payment by users to participate in the risk management contracts and payout of claims or results according to oracles. Different participants (insured, insurer, and contract designer) hold different amount of RISK, according to their respective requirements.

### **10.3 Conversion of RISK**

In consideration of the high transaction costs and long block confirmation time of Ethereum, GRE will develop its own public chain based on Graphene blockchain tool kit. After the completion of public chain development, all ERC20 standard RISK tokens generated on Ethereum will be converted to tokens on GRE's public chain in a 1:1 ratio.

### **10.4 Detailed Usage of RISK**

Please refer to Part 3.4 of this white paper for detailed usage of RISK.

### **10.5 Token Sale Plan**

Distribution of Tokens	Purposes
0.4	Token Sale
0.1	Foudation Management Fund
0.3	Community Dev Fund
0.2	Team Member

GRE will issue 40% of all tokens to community members.

The rest of RISK's distribution plan:

- 10% for Foundation managed fund, used for GRE Foundation's operation, will release in the next 2 years;
- 30% for community development fund, used for reward partners who contribute to GRE community.
- 20% for founding team and development teams, those tokens will be assigned to founding teams, such as early community contributors and future team members. As a team incentive plan, those tokens will be released step by step in two years, and unlocked 25% in every six months.

Chinese citizens will not be allowed to participate in RISK token sale plan.

Any Amercian citizen, permanent resident, or green card holder will not be allowed to involved in RISK's token sale plan, unless someone is a qualified investor after being certified in accordance with relevant U.S. securities laws.