



CAL – Rewards Good Health

*An ecosystem backed by blockchain
for daily calorie control and exercise*

Draft Version
Changes can be made without prior notices.

Disclaimer & clarifications to this Whitepaper

Please read this section very carefully to clarify uncertainties and ambiguities regarding any legal and financial matters in direct and indirect relation to the contents of this Whitepaper, and to avoid any unnecessary difficulties, disputes, and legal actions in the future. IF YOU ARE IN ANY DOUBT AS TO THE ACTION YOU SHOULD TAKE, YOU SHOULD SEEK PROPER LEGAL, FINANCIAL, OR OTHER PROFESSIONAL CONSULTATION.

The CAL tokens, as defined and described in this Whitepaper hereinafter, are not intended to constitute securities in any jurisdiction. This Whitepaper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities or a solicitation for investment in securities in any jurisdiction.

This Whitepaper does not constitute to solicit or sell any of the CAL tokens, and should not form the basis of, nor to be relied upon, in connection with any contracts or investment decisions.

The CLC Foundation will be the ruling body overseeing the CAL project hereon after and will deploy all proceeds of sale of the CAL tokens to fund CAL cryptocurrency project, businesses and operations. No person is bound to enter into any contract or binding legal commitment in relation to the sale and purchase of the CAL tokens and no cryptocurrency or other form of payment is to be accepted on the basis of this Whitepaper.

Any agreement between the CLC Foundation and you as a purchaser, and in relation to any sale and purchase of CAL tokens is to be governed by only a separate document setting out the terms and conditions of such agreement. In the event of any inconsistencies between the agreement and this Whitepaper, the former shall prevail.

You are not eligible and you are not to purchase any CAL tokens if you are a citizen, or a resident of any countries where public offerings of crypto tokens are banned or are considered as securities trading in general.

There are risks and uncertainties associated with CLC Foundation and CAL tokens, their respective businesses and operations, and the prospective buyers of CAL tokens should carefully evaluate CAL tokens and CLC Foundation before they make such decisions.

Disclaimer of Liability

To the maximum extent permitted by the applicable laws, regulations and rules, CLC Foundation, and all the affiliates of CAL businesses and operations shall NOT be liable for any losses of any kind, financial or nonfinancial, including but NOT limited to loss of revenue, income or profits, and loss of use or data, arising out of or in connection with any acceptance of or reliance on this Whitepaper or any part thereof by you.

Representations and Warranties by You

By accessing and/or accepting possession of any information in this Whitepaper or such part thereof, you represent and warrant to CLC Foundation as follows:

- A. you agree and acknowledge that the CAL tokens do not constitute securities in any form in any jurisdiction;
- B. you agree and acknowledge that this Whitepaper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities in any jurisdiction or a solicitation for investment in securities and you are not bound to enter into any contract or binding legal commitment and no cryptocurrency or other form of payment is to be accepted on the basis of this Whitepaper;
- C. you agree and acknowledge that this Whitepaper, the undertaking and/or the completion of the CAL token sale, or future trading of the CAL tokens on any cryptocurrency exchange, shall not be construed, interpreted or deemed by you as an indication of the merits of the CLC Foundation and the CAL tokens;
- D. you agree and acknowledge that in the case where you wish to purchase any CAL tokens, the CAL tokens are not to be construed, interpreted, classified or treated as:
 - i. any kind of currency other than cryptocurrency;
 - ii. debentures, stocks or shares issued by any person or any entity
 - iii. rights, options or derivatives in respect of such debentures, stocks or shares; or
 - iv. any other security or class of securities.
- E. you are fully aware of and understand that you are not eligible to purchase any CAL tokens if you are a citizen, or a resident in any countries where public offerings of crypto tokens are banned or are considered as securities trading in general;
- F. you are fully aware and understand that in the case where you wish to purchase any CAL tokens, there are risks associated with CLC Foundation, their respective businesses and operations, and the CAL tokens;
- G. you agree and acknowledge that CLC Foundation is NOT liable for any losses of any kind, financial or nonfinancial, including but not limited to loss of revenue, income or profits, and loss of use or data, arising out of or in connection with any acceptance of or reliance on this Whitepaper or any part thereof by you; and
- H. all of the above representations and warranties are true, complete, accurate and non-misleading from the time of your access to and/or acceptance of possession this Whitepaper or such part thereof.

Risks and Uncertainties

Prospective purchasers of CAL tokens should carefully consider and evaluate all risks and uncertainties associated with CLC Foundation, the CAL tokens, all information set out in this Whitepaper, and the legally binding purchase agreements prior to any purchase of CAL tokens. If any of such risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of CLC Foundation could be materially and adversely affected. In such cases, you may lose all or part of the value of the CAL tokens.

Table of Contents

Table of Contents	4
Table of Figures & Tables	5
Definition of Terminology	6
Motivation	7
One of the Most Serious Problems We are Facing Today: The Metabolic syndrome	7
5 Buckets of Deaths	7
Internet & Blockchain	8
Exercise & Rewards	9
Measurement & Rewards: Calorie Intake and Consumption	9
CAL: Rewards to You Who Manage Calorie & Exercises	9
In a Nutshell	10
1. CAL's Vision	11
A Cryptocurrency for Your Health & Longevity	11
The Birth of Calcoin	11
Value to Industries and Society	12
The CAL Ecosystem: Where All Participants Win.	12
The CAL Clients	13
The CAL Reserve & Exchange	13
The CAL Affiliates	14
The CLC Foundation: The Administrative Body for the CAL Ecosystem	14
Summary	14
2. The CAL Cryptocurrency	15
CAL: Cryptographic Token	15
Implementation: Ethereum and ERC223	15
3. The CAL Clients	16
The Target Population of Calcoin	16
Calcoin Wallet for Everyday CAL	16
The CAL Pedometer	18
Client Devices for Calorie Consumption Measurement	18
Smart wearable devices	18
Fitness Equipment	19
The CAL Distribution	19
Mining Apps and Calcoin Wallet	20
The KYC Process	21
The KYC Process for Minority	21
4. The CAL Reserve & Exchange	22
Ethereum Public Chain for CAL Generation & Ledger	23
The CAL Exchange & Trade	23
5. The CAL Affiliates	24
The CAL Affiliates	24
CAL Software Components & APIs for Affiliates	25
6. The CLC Foundation	26
Overview	26
Governance Goals	26
Board of Directors	27
External Auditor	27
Trust Company	27
Security Issues	27
The CLC Foundation Team & Track Records	28
The CAL Project Past & Future Milestones	28
The CAL Hard Cap & CAL Allocation Plan	30
Token Distribution Event	30
How Will the Proceeds Be Used?	31
Disposition of Unsold Tokens upon Token Event	31
Disposition of Foundation's CAL Allocation	32

The Nature of CAL Distribution: Half Life & Double Value	32
Perpetuation of Calcoin Ecosystem	33
3 Major Advantages of CAL	34
Protection Mechanisms for the Investors	34
ROI Expectations of CAL	35
7. The CAL Architecture & Future Evolution	36
Calcoin Service Architecture	36
Calcoin Client Side:	37
Calcoin Reserve and Distribution Servers	37
CAL Evolution Plan	37
8. Conclusion	39
The Dark Side of Economy, Where We Live in Now	39
The Bright Side of Economy, Where We Want to Be	39
The National Health Plan, the Same Story Applies	40
The Technological Innovations Have Made It Possible	40
9. The CAL Founding Team	41
The CAL ExecutiveTeam	41
Advisors	44

Table of Figures & Tables

Figure 1. Flow of Metabolic Syndrome Illustrated in One Picture	7
Figure 2. Causes of Death, 70% Attributed to Chronic Disease in 2014 in the US	8
Figure 3. Statistics of Korean Male and Female Diabetes	11
Figure 4. Benefits of Walking	12
Figure 5. A Picture of the CAL Ecosystem Structure	13
Figure 6. The 1 st Group of Calcoin Target Population	16
Figure 7. Number of Diabetics per Nation in 2013	16
Figure 8. Calcoin Wallet Landing Page	17
Figure 9. Example of the CAL Pedometer	18
Figure 10. The CAL Distribution Process	19
Figure 11. Daily Number of Steps and CAL Reward Schedule (a Referential Model)	20
Figure 12 Calcoin Mining Apps and Wallet	20
Figure 13. The CAL Reserve & Exchange Structure	22
Figure 14. CAL Affiliates Are Positioned to Serve CAL Clients	24
Figure 15 CLC Foundation Project Past Milestones	28
Figure 16 CLC Foundation Future Project Milestones	29
Figure 17. How the Proceeds from the Token Distribution Event Will Be Used	31
Figure 18 Flow of Calcoin and Perpetuation of Calcoin Ecosystem	33
Figure 19. 3 Major Advantages of CAL	34
Figure 20 CAL Dynamics Projected	36
Table 1. The CAL Generation & Allocation Plan	30
Table 2. The CAL Token Sale Schedule	30
Table 3. The Characteristics of the CAL Distribution Algorithm	32

Definition of Terminology

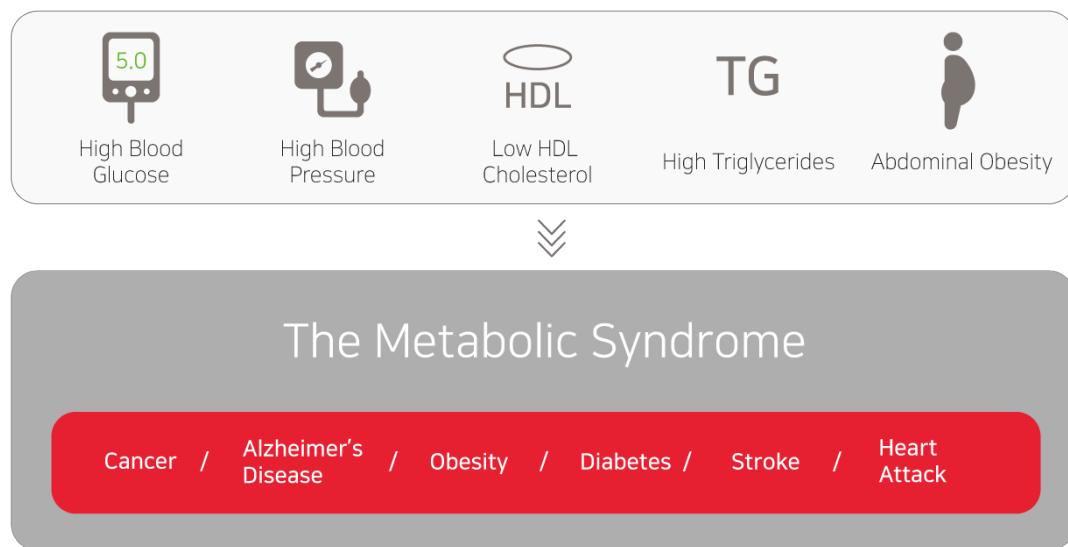
- **CAL**: The unit of Calcoin as cryptocurrency, also is used as an abbreviation of Calcoin
- **Calcoin, Calcoin**: brand names of the CLC Foundation's token being offered as rewards to health and calorie control, and adheres to the ERC223 token standards
- **CLC Foundation**: an organization established to administer Calcoin service in February 2018

Motivation

One of the Most Serious Problems We are Facing Today: The Metabolic syndrome

Over the last 40 years, the world has seen a new trend emerging: an explosion of chronic diseases categorically called “Metabolic Syndrome”. In the US, 52% of the entire population is believed to have the syndrome.¹ Metabolic Syndrome is accounted for 75% of \$2.7 Trillion US health care budget in 2014 and is expected to grow. In the rest of the world, many countries are already in a similar situation, or are catching up very fast. This is a slow-moving disaster in a global scale that we have never been experienced before.

Figure 1. Flow of Metabolic Syndrome Illustrated in One Picture



5 Buckets of Deaths

The following quotation is sourced from the paper written by CrossFit, a health organization based in California.

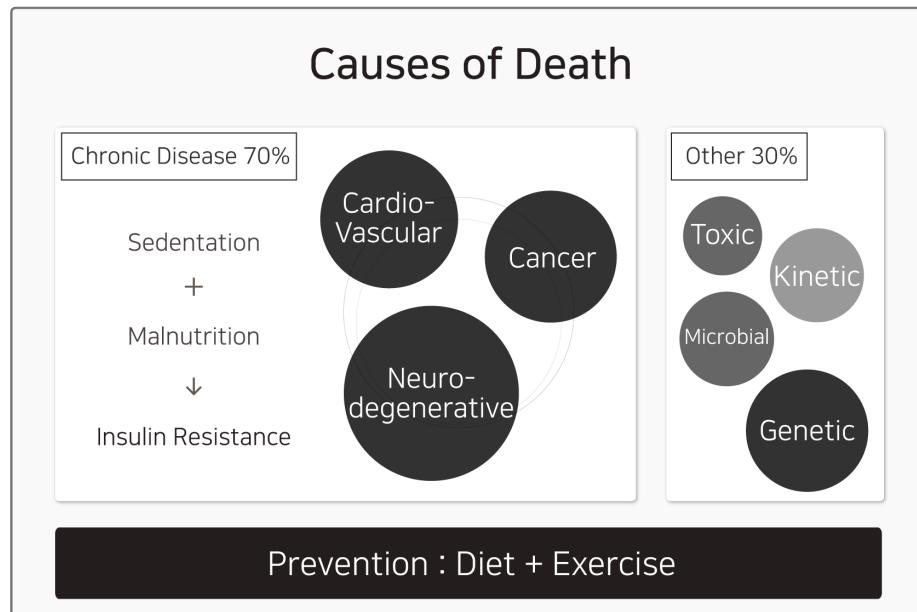
“Seventy percent of deaths in the United States are attributable to chronic disease. Of the 2.6 million people who died in the United States in 2014, about 1.8 million died from chronic disease. This pattern of increasing deaths due to chronic diseases also holds in countries that are ravaged by infectious disease. The numbers are rising, and

¹ Dr. Robert Rustic, lecture on Frontiers of Science, November 6, 2014, <https://www.youtube.com/watch?v=uIIIXUZwpB-U>

when we finally add the positron-emission-tomography-positive cancers in, the number might be 80-85 percent in the United States.

It is estimated by the Centers for Disease Control (CDC) that the United States could have up to a hundred million diabetics in 2050. That will affect everyone. You will not go into the emergency room for something as simple as a broken arm: **You will be seeing heart attacks on every corner. Medicine has no solution; you do.**²

Figure 2. Causes of Death, 70% Attributed to Chronic Disease in 2014 in the US



70% of all deaths in US in 2014 are attributed to chronic disease. Major causes of the chronic disease have been sedentation and malnutrition. The most significant internal measurement is known to be the level of "insulin resistance".³

Internet & Blockchain

The advent of Internet has brought a new era and paradigm of information and knowledge sharing to the humanoid, and it has changed our daily lives so profoundly that no one had ever imagined prior to the Internet, and we have become a different species, "Internoid".

Perhaps, we are witnessing the second round of such revolution repeating in less than a 20-year period; it is now what we call "Blockchain". As William Mougayar puts it in his book⁴: "The Blockchain cannot be described just as a revolution. It is a

² http://library.crossfit.com/free/pdf/CFJ_2016_08_Luck-Glassman-V7.pdf

³ Dr. Ted Naiman lecture, Insulin Resistance, <https://www.youtube.com/watch?v=Jd8QFD5Ht18>

⁴ William Mougayar: The Business BLOCKCHAIN, Promise, Practice, and Application of the next Internet technology

tsunami-like phenomenon, slowly advancing and gradually enveloping everything along its way by the force of its progression. Plainly, it is the second significant overlay on top of the Internet, just as the Web was that first layer back in 1990. That new layer is mostly about trust, so we could call it the trust layer.”

Exercise & Rewards

There are two main reasons when people engage in controlled diet and exercise: for better health and for better look. In both cases, diet and exercise are considered as a critical factor in achieving the desired goals. Clearly diet and exercise are the perhaps the only way to lose weight and gain health back from the metabolic preconditions and diseases, assuming that the person stays within dietary modesty and away from other undesirable activities.

Measurement & Rewards: Calorie Intake and Consumption

The subject of this White Paper is an ecosystem, where participants would measure the number of calories consumed for which the reward will be the CAL, a cryptographic token based on blockchain

There are many ways how calorie consumption can very easily be measured, especially when you work out. The most prevalent ones are the smartphones with the intrinsic health-o-meter and pedometer functions. Also, there are the wearable smart devices, available on the market with more rigorous and precise measurement functions.

CAL: Rewards to You Who Manage Calorie & Exercises

The motivation for our project “CAL” is to reward you who manage their calorie consumption and exercise. Weight control and exercise are beneficial to our health, but they are also beneficial to the society, as this translates into billions of dollars of savings in medical bills. Promoting and rewarding calorie management seems to be a mission of justice and substance for people and the health service providers all alike. So, it makes sense to reward those who exercise and manage calories daily and continuously.

CAL is a crypto coin to be distributed as rewards to individuals by measuring caloric consumption and monitored in real time through the CAL Blockchain network. Just like any other cryptocurrencies, CAL can be traded or used as payment method to

endorsing shops and services. CAL coin can be kept as an investment as we expect the CAL coin value to rise with the increasing adoption and use cases expansion.

In a Nutshell

Today, the chronic diseases are considered to be metabolic disorders, of a relatively new and modern kind. The proliferation of this affliction is crushing the society in all advanced nations globally

The major causes of the disorder are the excessive calorie intake and the lack of mobility. Calorie restriction is also known to increase longevity and expands healthy lifespan for humans and animals alike. CAL is a crypto coin to be awarded to those who control their calorie intake and exercise, in the form of a digital token. As its usages and the acceptance level grow, the CAL Ecosystem will be formed where CAL will circulate within.

At this first stage of the CAL project, the focus will be on the consumption of calories by clients, leaving the calorie intake management side to the second phase.

1. CAL's Vision

A Cryptocurrency for Your Health & Longevity

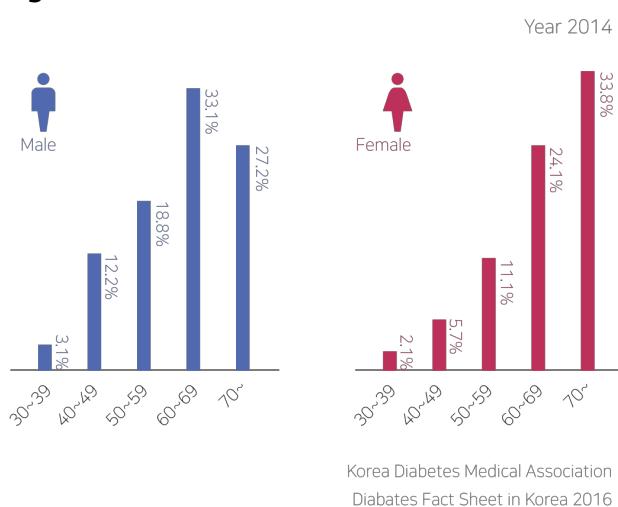
CAL is born to motivate and reward people who practice calorie restriction and exercise for a longer and healthier span of life. Health is everything; you lose your health, you lose everything. Yet, calorie control and exercise are somehow what most people procrastinate or skip altogether. The reason could be that it has to become a lifestyle and habit, and this requires a long term and continuous commitment. CAL can nudge people to get up and go.

CAL coin is only the first stepping stone of a much bigger ecosystem. For a cryptocurrency to be viable, it must have an intrinsic value. The ecosystem will support to boost its value. So, in the next section we will describe how the ecosystem will interconnect and give value to CAL and the participants.

The Birth of Calcoin

During the past two years, the CLC Foundation has been reviewing various business models related to blockchain. By combining the Blockchain technology with the healthcare field, the CLC Foundation has determined that it can address the biggest problems facing mankind, obesity and metabolic syndrome. Just like mining Bitcoins by solving a mathematical problem, you can get a Calcoin by exercising.

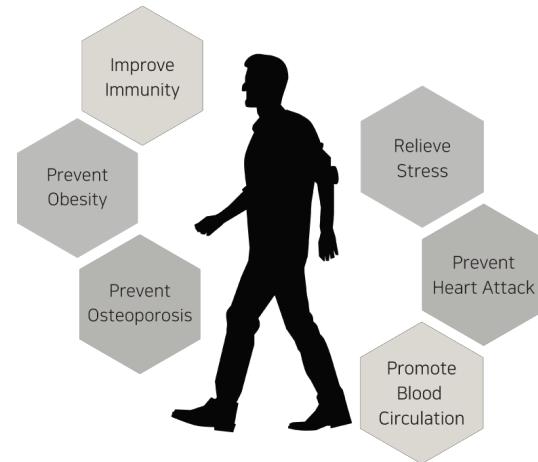
Figure 3. Statistics of Korean Male and Female Diabetes



The worst in Asian countries, Korea's diabetes patients demand 65% of the national health insurance budget. We are convinced that even with a walk of 10,000 steps a day that consumes 300 Kcal, this number can be reduced to less than half.

"It seems that the psychological goal of filling up the numbers in pedometer makes people more active," says Dr. Brabata of Stanford University. "Even if you do not scorch your pedometer, you would be more active than before," he said. "If you walk 2,000 steps a day, your physical health will improve 27%, which can be a great help for people who do not move as much."

Figure 4. Benefits of Walking



Value to Industries and Society

There always are two sides of a coin, and so has CAL: the generation side of CAL, and the consumption side of CAL. The generation side of CAL is rather personal in nature as CAL is distributed when people move. But on the consumption side of CAL, multiple industries, societies and nations will be deeply involved in the CAL project and will profoundly benefit from it.

Will the health insurance companies and national health services benefit from a better preventive public health? Yes, as they should carry and adopt CAL as part of their premiums. In the long run, this downtrend in medical costs will benefit greatly in the advanced societies, where the medical costs are skyrocketing.

The CAL Ecosystem: Where All Participants Win.

In this section, a more detailed look into CAL ecosystem is presented. All participants are being driven by incentives and intrinsic values. There are a few major components in CAL ecosystem, illustrated in the following picture

Figure 5. A Picture of the CAL Ecosystem Structure



The CAL Clients

The CAL Client Side is where CAL is rewarded as the individuals exercise. The smart devices that individuals wear will measure the number of calories consumed. Thus, the ability of the client device to measure the calories to a certain degree of precision, and to detect the genuine nature of the motions by the client is critical to maintain the integrity of the ecosystem. A well-balanced algorithm will calculate the amount of CAL to be awarded.

The CAL Reserve & Exchange

The CAL Reserve & Exchange is where CAL is generated, distributed, exchanged, and traded:

- Blockchain for CAL transactions
- Backend servers for all CAL operations
- CAL Exchange and Trade

The CAL Affiliates

The CAL Affiliates are the ones which will accept CAL, and incentivize their customers using CAL. Whether or not to accept CAL will be their business decision. When they do, they will become a member of the CAL Ecosystem, and play a vital role in providing necessary financial backing to the ecosystem. The affiliates will accept CAL as part of payment for their products and services.

The CLC Foundation: The Administrative Body for the CAL Ecosystem

The CLC Foundation, a nonprofit organization, has been established to oversee the fair and productive growth of the CAL Ecosystem. The CLC Foundation will administer the CAL supply and the CAL Reserve & Exchange. It will also provide support and tools for CAL services to operate more easily within the ecosystem. Ultimately, the CLC Foundation will facilitate the entire ecosystem's transition to a fully decentralized and autonomous network.

Summary

CAL ecosystem is expected to grow geographically and across diverse industries worldwide. The CAL Ecosystem will be made very easy to connect to get all the participants connected with simple and open APIs. Any vendors or shops interested in joining the ecosystem should be able to do so thanks to Web based APIs, without a highly technical expertise required.

Through a series of economic and technological transformations, and based on a new cryptocurrency called CAL, the CLC Foundation will work toward creating the first open and sustainable ecosystem. The economic incentives at the core of this ecosystem will ensure that all participants – users, founders, and service providers and vendors – will ultimately benefit from this work.

The CLC Foundation will encourage a network effect for CAL by becoming its first large adopter and sponsor. It will also establish the CLC Foundation as the custodian of the CAL Ecosystem.

2. The CAL Cryptocurrency

CAL: Cryptographic Token

CAL, a cryptographic token built on top of the blockchain technology, is the unit of reward for calorie management, to be accumulated in the user Calcoin Wallet.

In character, CAL is a pure cryptocurrency of fixed supply. It is fractionally divisible and long-term non-inflationary. However, as described below, only a small portion of the CAL supply will become liquid in the near future, as most of the CAL supply is reserved for the CAL Reserve & Exchange.

Like other cryptocurrencies, units of CAL are fungible and transferable, and they will be expected to be traded on established cryptocurrency exchanges.

Implementation: Ethereum and ERC223

CAL will be implemented on the public Ethereum blockchain as an ERC223 token.⁵

The Ethereum blockchain is currently the industry standard for issuing custom digital assets and smart contracts. The ERC223 token interface allows for the deployment of a standard token that is compatible with the existing infrastructure of the Ethereum ecosystem, such as development tools, wallets, and exchanges. Ethereum's ability to deploy Turing-complete trustless smart contracts enables complex issuance rules for cryptocurrencies, digital financial contracts, and automated incentive structures.

The ERC223 standard reduces network transmission costs by half compared to the ERC20 standard, and is an enhanced version that eliminates several problems and bugs that occurred in ERC20.

⁵ ERC20 is the Ethereum token standard. <https://github.com/ethereum/EIPs/issues/20>

3. The CAL Clients

The CAL Client Side is where CAL is rewarded as an individual controls calorie consumption and work-outs. In this section we will take a close look at:

The Target Population of Calcoin

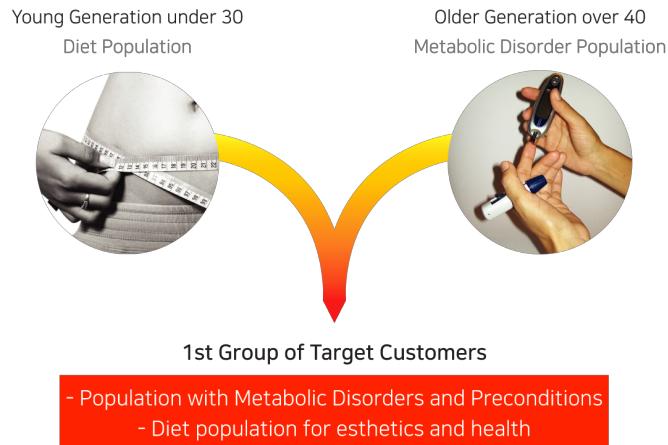


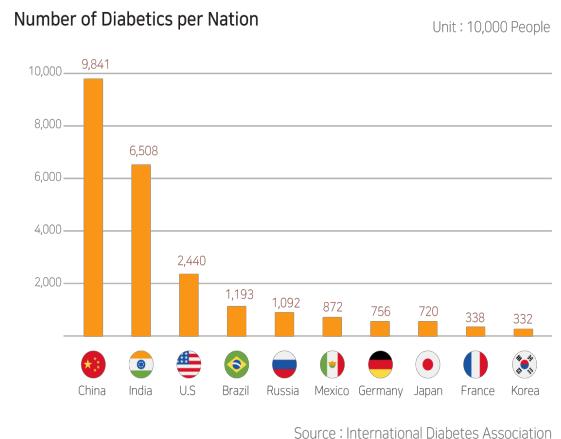
Figure 6. The 1st Group of Calcoin Target Population

As the picture shows, the first group of Calcoin's target population will be the young generation of 30s or younger with the needs for diet needs for esthetics and health management, and the older generation of 40s or older who suffers from metabolic disorder

or in precondition of it.

Figure 7. Number of Diabetics per Nation in 2013

According to the International Diabetes Federation (IDF), China leads the world in terms of the number of diabetes in 2013 with 98 million people, followed by India with 65million, and the US with 24 million. Regionally, the western Pacific region which spans over Australia, China, and Japan boasts ranked as number one region in the world as the most diabetes plagued area with 138 million diabetes.



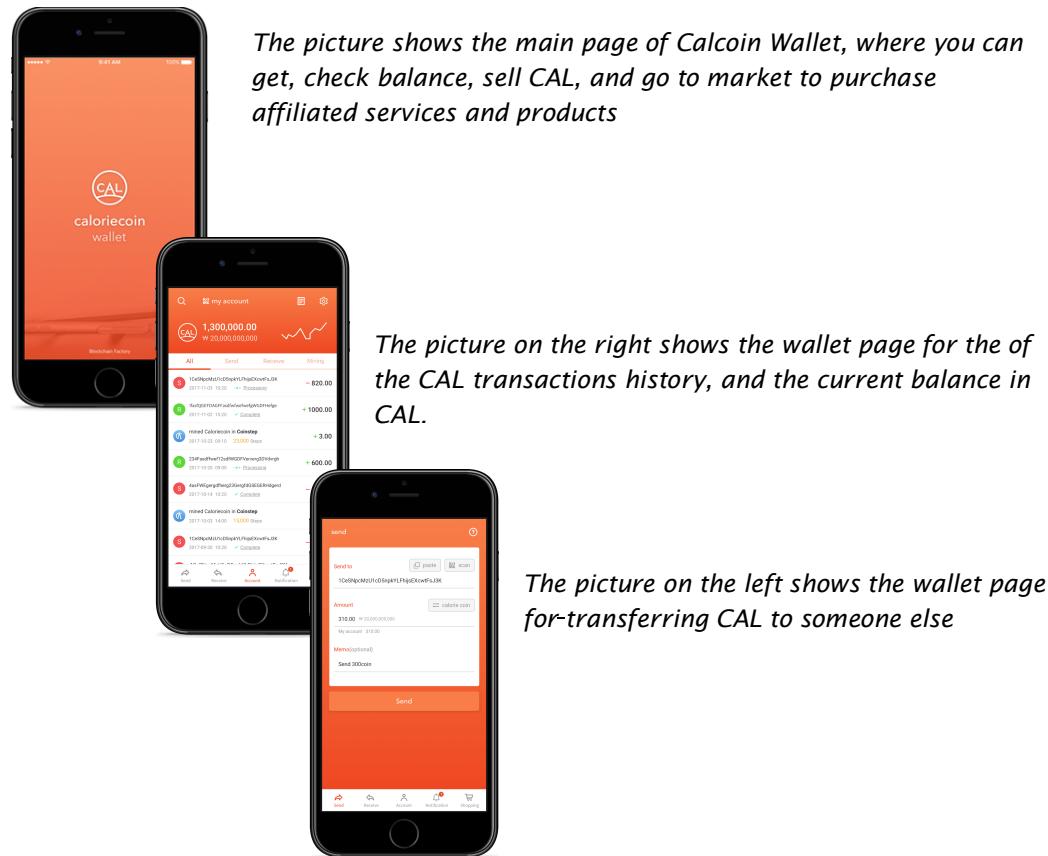
Calcoin Wallet for Everyday CAL

Your first entry to the CAL land is Calcoin Wallet. The user experience of CAL starts when you download Calcoin Wallet. The users should find it easy-to-use and simple. There should be no barriers nor intimidation for an average person with smartphone.

The main functions are:

- Get CAL: calorie control detection by connecting with the internal pedometer and reporting to server, CAL request, reception, and storage
- CAL Balance, transaction records
- Sell CAL: send to someone else, exchange, trade CAL to cash, and other virtual coins.
- Go to Market: purchasing of products and services with CAL

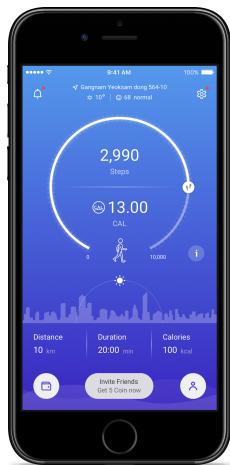
Figure 8. Calcoin Wallet Landing Page



The CAL Pedometer

The picture below shows an example of a pedometer that works with Calcoin Wallet.

Figure 9. Example of the CAL Pedometer



The CAL pedometer will provide the following functions:

- Statistical data of pedometer measurements
- CAL earnings via collaboration with Calcoin Wallet
- Finding friends

The picture on the left shows an example of the pedometer main page. The pedometer will provide actual walking data of clients to the Calcoin wallet, so that the wallet can receive CAL.

Client Devices for Calorie Consumption Measurement

Smartphones are limited when detecting people's various activities. There are many other devices and machines that people can use to burn energy and to better monitor their calorie consumption.

Smart wearable devices

One good example is a smart wearable device, which comes with measurement functions of calorie, heart beat rate, travel distance, and altitude change, etc. Thus, this type of devices can measure calories more precisely than a smartphone pedometer so more CALs can be rewarded.



To support CAL, Wearable devices need to communicate with the Calcoin Wallet running on smartphone, and thus requires software upgrade. The CLC Foundation will supply the necessary APIs to the participating vendors.

Fitness Equipment

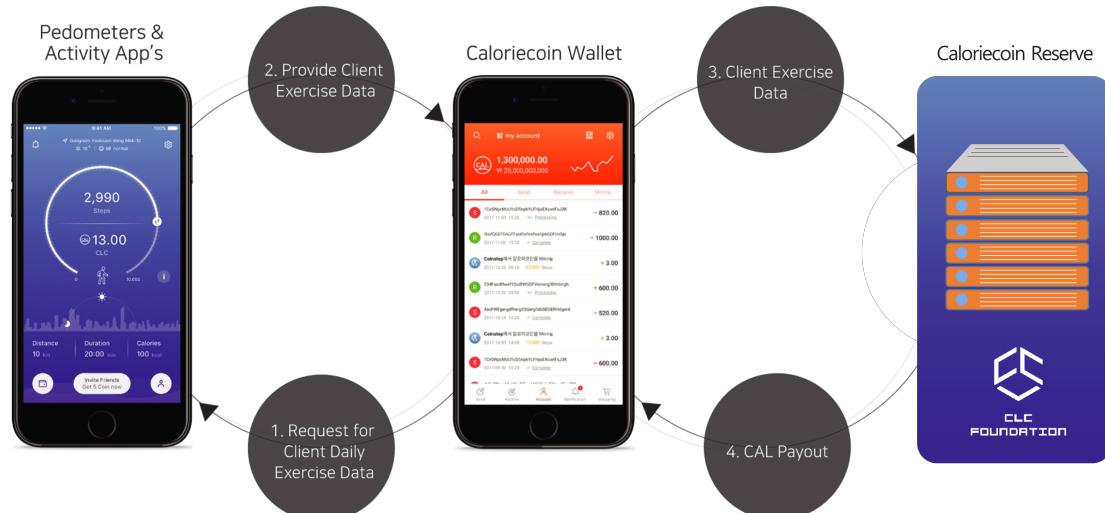
There are many types of workout equipment in fitness centers and homes. These machines can be made CAL enabled by attaching a CAL oMeter, a small smart device that can communicate with Calcoind Wallet and measure the workout. A reference design of CAL oMeter will be furnished by the CLC Foundation.



The CAL Distribution

The picture below shows how a client will earn CAL. We expect that this process will take place automatically when the client exercises or walks more than the daily default number of steps.

Figure 10. The CAL Distribution Process



In the above picture, the pedometers and activity apps include the pedometer that we provide called “Coinstep”, and all the other pedometers and activity apps available in the market today. The apps from third parties need to be upgraded to communicate with our Calcoin Wallet.

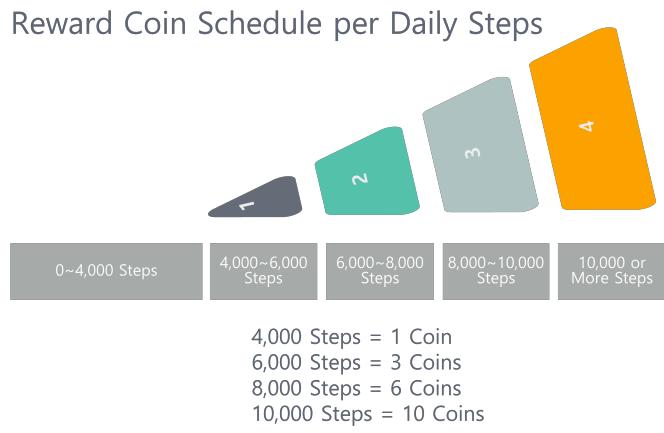


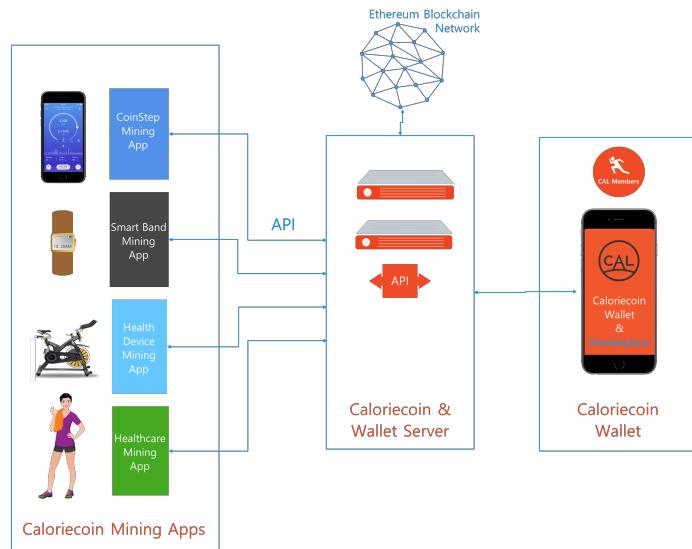
Figure 11. Daily Number of Steps and CAL Reward Schedule (a Referential Model)
This picture shows a referential model of daily CAL reward schedule where a client will start to earn CALs when one walks more than 4,000 steps, and one will earn a maximum of 10 CALs when one walks more than 10,000 steps on a day.

Mining Apps and Calcoin Wallet

In this section, a clear delineation between mining apps and the Calcoin Wallet is being made.

The term mining apps refer to the category of apps that measure the amount of physical activity (walking, hiking, or dancing), and the consumption of calories as result. They are typically available as pedometers, hiking and GPS tracking apps, and other types of activity apps.

Figure 12 Calcoin Mining Apps and Wallet



The mining in this context only has a symbolic meaning that an activity that earns a crypto coin can be categorically referred to as mining. In Calcoin, walking and running can be said as mining.

The Wallet is a cryptocurrency wallet to receive, store, and send coins. The Wallet communicates with the server to obtain the exercise data, and to receive Calcoin in return. The Wallet also has the payment module and the marketplace for Calcoin so that users can purchase and pay with CAL.

Calcoin Wallet is expected to be implemented as a soft wallet, where most of the critical resources, such as the coin balance, and the private key, are saved in the server. That way, if you lose your phone or password, you will be able to recover them easily.

The KYC Process

Facing the complexity of raw cryptocurrency technology is typically onerous for most consumers. Issues of transaction fees, private keys, and alphanumeric addresses create usability barriers for mainstream users, including the common requirement to hold cryptocurrency in the first place in order to obtain and utilize other tokens. CAL will aim to significantly reduce these onboarding frictions. The onboarding process for users will not require prior expertise with cryptocurrencies before being able to interact with CAL.

The first comers will need to register in Calcoin Wallet via the CAL KYC process. The KYC (Know Your Customer) process will be all online and quick requiring only about 3 minutes to complete. It will require users to capture a photo of themselves holding a valid ID card, passport or driving license and transmit it to the server. At the server, this photo will be analyzed, and the user will be registered.

The KYC Process for Minority

Minorities may require consent of parents as part of the KYC process, and the additional step will be added accordingly to conform the jurisdictional bylaws.

4. The CAL Reserve & Exchange

The CAL Reserve & Exchange is the place where CAL is generated, distributed, exchanged, and traded:

- Interface to Ethereum public chain for CAL generation & ledger
 - ✧ CAL generation & reserve management
 - ✧ CAL distribution control
 - ✧ CAL transfer transaction management
- CAL Exchange & Trade for clients and affiliates
 - ✧ CAL exchange to other cryptocurrencies and fiat currencies
 - ✧ Trading of CAL into other cryptocurrencies and fiat currencies
- CAL Ecosystem membership management

Figure 13. The CAL Reserve & Exchange Structure



Ethereum Public Chain for CAL Generation & Ledger

As of April 2018, the average block time for the Ethereum network is 15 seconds. Because the Ethereum network currently operates in the Proof of Work blockchain, there is a limit on throughput. When switching to PoS in the future, the blocktime is expected to be instantaneous.

The number of transactions per day in the Ethereum network is steadily increasing. As of 2018, there are 800,000 transactions per day, and this volume is expected to continue to increase as new applications and users continue to grow. The Ethereum network will be tuned to higher volume resources to further increase throughput. From a long-term point of view, Vitalik Buterin's scalability paper⁶ says that 100,000 tx / sec might be possible, but that would be possible through future breakthroughs in Ethereum network.

Also, because of the following two issues, a pure on-chain architecture may not be optimal at first. The first issue is that Ethereum transaction verification time takes longer than normal users expect, so it is still difficult to apply in areas that require fast responses. The second is that all the users have to pay a network fee for every transaction in Ethereum network. In order to solve these issues, the Foundation should implement the off-chain based network architecture in the long term and this is one of the tasks to be resolved by the CLC Foundation.

The CAL Exchange & Trade

The CAL Exchange & Trade (CET) is the service for CAL users and affiliates where they can exchange and trade CAL to other cryptocurrencies. A more detailed implementation plan for the CET will be made public in a separate technical document with the time line of H2 2018.

⁶ https://github.com/vbuterin/scalability_paper/blob/master/scalability.pdf

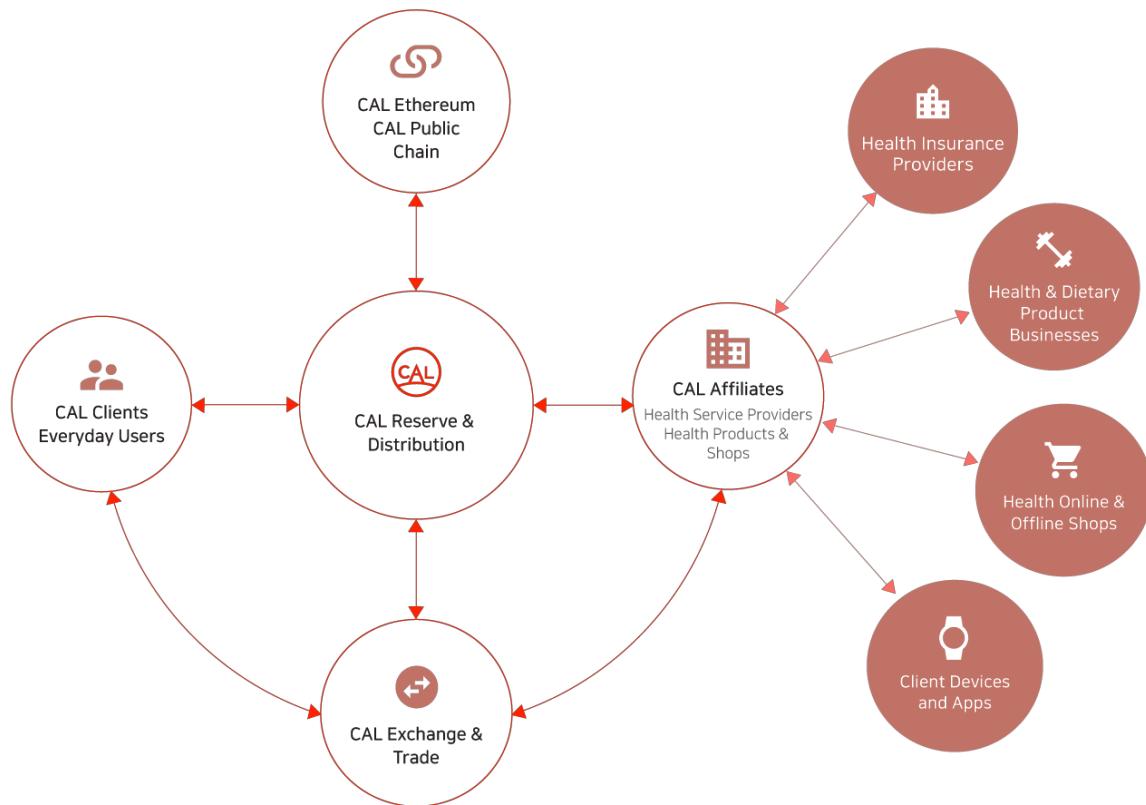
5. The CAL Affiliates

The CAL Affiliates

The affiliates will accept CAL, as in its pure form before being converted to any other currencies, as part of payment for their products and service.

Also, the affiliates are the eventual beneficiaries of CAL from the savings in expenditure in medical and health maintenance costs, and from the increase in revenue directly and indirectly from CAL clients. They, in the long run, will supply the fuel to the longevity of CAL by being the consumer of CAL.

Figure 14. CAL Affiliates Are Positioned to Serve CAL Clients



Some of the prospective affiliates are the entities involved in health and diet as their main business and the ones who sell products tightly related to health, such as:

- Health insurances
 - ✧ Health insurance industries
 - ✧ National health plan
- Health & dietary product businesses
 - ✧ Health & sports equipment vendors
 - ✧ Dietary foods and supplements manufacturers
 - ✧ Outdoors equipment manufactures
- Online/offline shops
 - ✧ Online/offline health & dietary shops
 - ✧ Gyms & obesity management shops
- Client devices and apps
 - ✧ Smartphones and smart wearable devices
 - ✧ Smart shoes and sneakers
 - ✧ Health and pedometer app vendors
- Small payment applications
 - ✧ Mobile payment for small valued items
 - ✧ Public transportation payment (offline payment)

CAL Software Components & APIs for Affiliates

The CLC Foundation has implemented different services and will continuously improve the software components for the affiliates. The Services are:

- CAL token and CAL token Exchange & Trade
- Calcoin Wallet and CAL Card
- CAL backend server
- CAL affiliate software and APIs

CAL Standard Open APIs will be defined and developed for affiliates to easy connections and enable the CAL Ecosystem. They will define the external interface functions such as:

- Devices and apps interface for CAL Client Side
- CAL payment modules for CAL Affiliates

6. The CLC Foundation

Overview

The CAL Ecosystem is envisioned as a community of ecosystem partners that adopt the CAL cryptocurrency. The CLC Foundation is intended to be an independent, nonprofit, and democratic governance body for the members of this ecosystem.

The CLC Foundation will establish the long-term policies and important decisions in the following matters:

- Technical support for the implementation and the development of the CAL Ecosystem
- Issues related to all membership of the ecosystem
- CAL Reserve & Exchange operations

The CLC Foundation's long-term goals are:

- To furnish the open environment where the ecosystem will expand to empower all the members with CAL
- To enable developers to develop, deliver, and enhance those services and attract users, in an open and sustainable platform.

In order to fulfill its mission, the CLC Foundation will dedicate its resources to three specific goals in relation to research, development, and governance as described below.

Governance Goals

The CLC Foundation will commit resources to establish fair and transparent governance and processes, considering the opinions and circumstances of all participants in the ecosystem. This open management model determines and oversees the following:

- Policy and decisions regarding CAL Reserve & Exchange operations
- Membership process and participation eligibility and rules
- Analysis and Responses to legal issues
- Analysis and Responses to industry standards compliance
- Determination of other key aspects of the CAL ecosystem

The Foundation will direct and fund the development of tools that give to the ecosystem partners the ability to build, grow, and create value for one another. The CLC Foundation will further this work by engaging development teams to continuously improve the technology supporting the CAL Ecosystem. The foundation will maintain the CAL Open Standard APIs for the benefit of the ecosystem participants.

Board of Directors

The Board of Directors for CLC Foundation has been established since the inception of the foundation, and the CEO, COO, and CTO of CLC Foundation sit in the board.

The board's powers, duties, and responsibilities must follow the Singapore government laws and regulations, and the organization's own constitution and bylaws.

External Auditor

CLC Foundation shall designate an External Auditor with track records and reputation in the profession to audit all the financial decisions and daily transactions carried out by the company. The External Auditor must perform a full audit on the company books on the annual basis, and report the result to the government authority as required by the Singapore's corporation law, and also make it public via uploading it on the company's web site.

Trust Company

The CLC Foundation shall hire a trust company to manage the total of funds collected from the public coin distribution events. The trust company should be the one with public reputation and track records in its line of work.

Security Issues

All major private keys of the company shall be split and shared by multiple individuals. This key sharing is intended to prevent one single individual to carry out company financial transactions.

Also, a single individual responsible in the one segment of the company businesses shall not be responsible in another segment of duties and roles.

The CLC Foundation Team & Track Records

The CLC Foundation has a team of leaders and engineers with the following track records:

1. **Global Remittance Service:** Implemented the global remittance service constructed on cryptocurrencies connecting 20 countries around the world
2. **Arbitrage Bot:** Implemented the arbitrage bot connecting a few global crypto exchanges
3. **Crypto Credit Card:** Implemented Crypto Currency Credit Card service on top of Hyperledger blockchain. The software was delivered to a major credit company.
4. **Calcoin Project:** The team have been implementing all the software components for the Calcoin infrastructure and the token event.

The CAL Project Past & Future Milestones

Figure 15 CLC Foundation Project Past Milestones

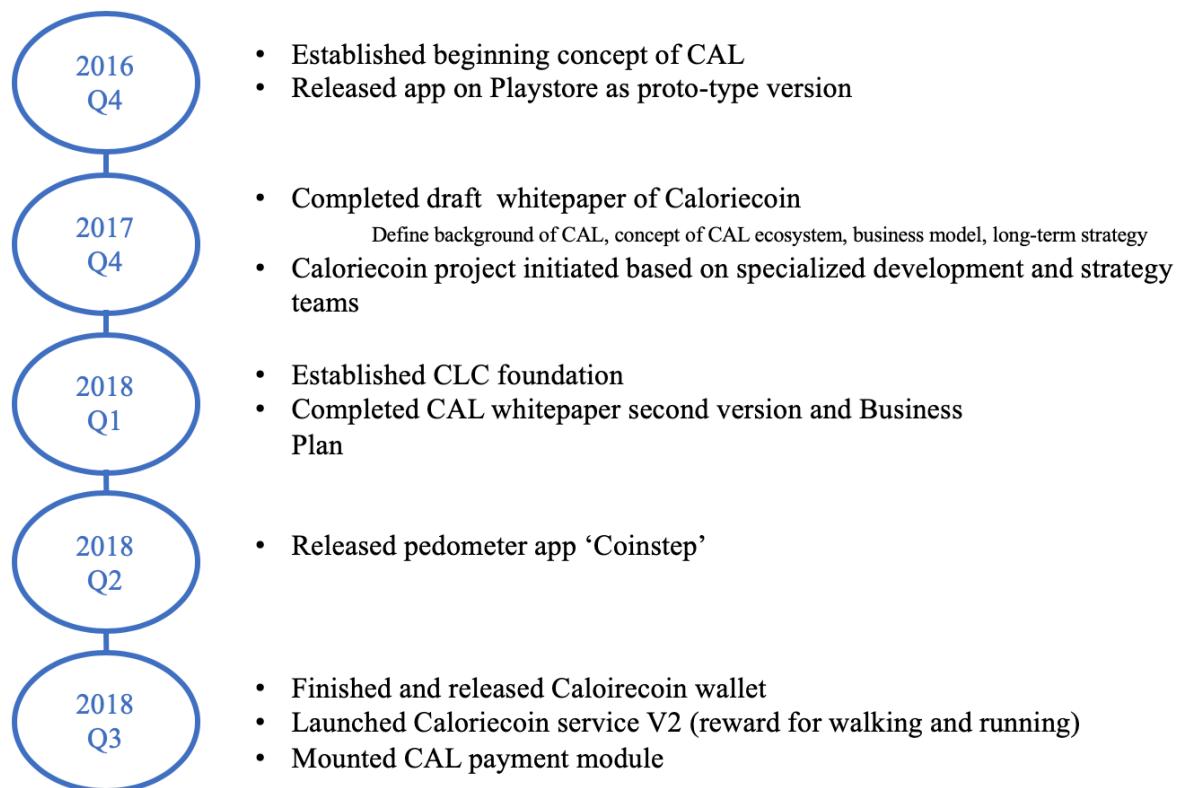
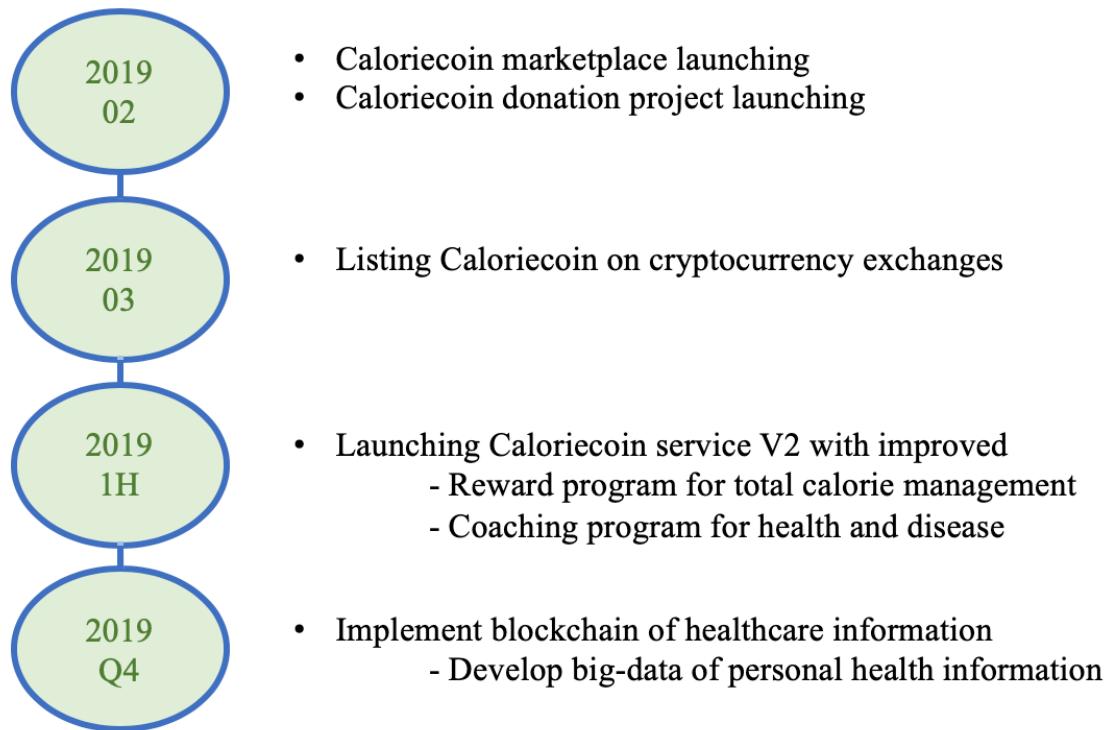


Figure 16 CLC Foundation Future Project Milestones



The CAL Token Issue Scheme

The CAL Hard Cap & CAL Allocation Plan

Table 1. The CAL Generation & Allocation Plan

	Total Generation Amount	Token Sale Amount	Reserve	Team & Advisers	Community Group & Strategic Partners	CLC Foundation	CAL Miners
CAL coin	100%	10.0%	2.0%	3.0%	5.0%	15.0%	65%
Amount	10,000,000,000	1,000,000,000	200,000,000	300,000,000	500,000,000	1,500,000,000	6,500,000,000

The table above shows the total CAL generation and allocation plan. The hard cap for CAL has been fixed at 10 billion tokens.

The allocation of the tokens, as is shown in the Table 1, will be rigorously adhered for the sake of the transparency of the project.

The CLC Foundation's allocation will be used for three objectives: 1) to administer the CAL token supply and CAL Reserve & Exchange, 2) for marketing, and 3) for operational costs.

- CAL Reserve & Exchange Operations:** The CLC Foundation will administer the rewards mechanism used to incentivize participation in the CAL Ecosystem, as described previously.
- Marketing:** A reserve of supply used for generating a starting balance for partnerships integration.
- Operational Costs:** The CLC Foundation is established to ensure the independent governance and growth of the CAL Ecosystem. A small portion of CAL rewards will be allocated to fund ongoing operational, legal, and development cost.

Token Distribution Event

The Foundation will commence the token distribution event once the CLC Foundation has completed the technology upgrade to integrate the CAL Ecosystem and the cryptocurrency to be used functionally within CAL.

Table 2. The CAL Token Sale Schedule

	1st Pre Sale	2nd Pre Sale	ICO or Private Sale
CAL coin	200,000,000	300,000,000	500,000,000
Coin/ETH	40,000 Coin/1ETH	30,000 Coin/1ETH	20,000 Coin/1ETH

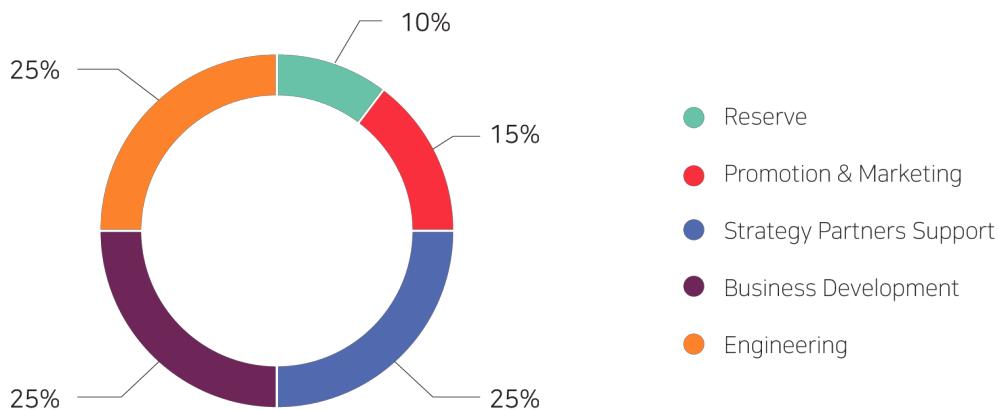
In order to finance the CAL roadmap, the CLC Foundation will conduct a token distribution event that will offer 1 billion out of the 10 billion-unit total supply of CAL. The proceeds of the token distribution event will be used to fund CAL operations and to finance the CLC Foundation. A portion of the funds raised in the token distribution will be used to execute the roadmap of additional feature development planned for the CAL integration into the CAL Ecosystem.

To be notified of updates regarding the token distribution event, participants are invited to provide their email address at <https://www.calorieco.in>. The pre-registration process may require a proof of identity and residence for larger purchases in order to ensure regulatory compliances at the time of the token distribution event. Further announcements regarding the timing and structure of the sale will be communicated through the portal.

How Will the Proceeds Be Used?

Upon the completion of the token distribution event described in the previous section, the proceeds are expected to be used by CLC Foundation as shown in the diagram below.

Figure 17. How the Proceeds from the Token Distribution Event Will Be Used



Disposition of Unsold Tokens upon Token Event

Upon the completion of the token distribution event, all the remaining tokens, if any, will be reallocated to CLC Foundation, and will be merged into the existing Foundation's allocation. Thus, the unsold portion will be used and invested on the CLC Foundation's discretion for the Foundation and Ecosystem.

Disposition of Foundation's CAL Allocation

25% of the total CAL distribution is under the control of CLC Foundation in the form of Reserve, and others as shown in **Table 1. The CAL Generation & Allocation Plan**. To avoid downturn of CAL currency market and to prevent any negative impact from releasing of CALs from the allocation, it is planned that less than 10% of the total CALs under the control of CLC Foundation be released in one-year period. This will not only fortify Foundation's long-term operability, and but also will it prevent a sudden outflow of CALs into the market.

The Nature of CAL Distribution: Half Life & Double Value

Table 3. The Characteristics of the CAL Distribution Algorithm

CAL Coin Half-Reward Schedule: As memberships double, the amount of reward coins shrinks by half, but the value of the CAL coin doubles

	Memberships Amount	Expected Reward Coin Volume - Daily Average	Expected Reward Coin Volume - Monthly Average	Total Month Reward Coins	Total Annual Reward Coins
The time span for each step is expected to vary between 1~3 months ↓	1	300 000	5	45 000 000	540 000 000
	2	600 000	2,5	45 000 000	540 000 000
	3	1 200 000	1,25	45 000 000	540 000 000
	4	2 400 000	0,625	45 000 000	540 000 000
	5	4 800 000	0,3125	45 000 000	540 000 000
	6	9 600 000	0,15625	45 000 000	540 000 000
	7	19 200 000	0,078125	45 000 000	540 000 000
	8	38 400 000	0,0390625	45 000 000	540 000 000
	9	76 800 000	0,01953125	45 000 000	540 000 000
	10	153 600 000	0,009765625	45 000 000	540 000 000
	11	307 200 000	0,0048828125	45 000 000	540 000 000

As shown in the picture above, CAL coins will be distributed on an average of 5 coins per member per day, but when the number of members increases to 600,000, the average daily CAL distribution per member is reduced to 2.5 coins. So, the foundation will distribute 540 million coins per year in average. As such, in 11 years, CLC Foundation will have completely consumed the new issuance of coins (6.5 billion coins) through the public reward distribution.

Perpetuation of Calcoin Ecosystem

Now a question rises as to what will happen to the CAL after 11 years of existence?



Figure 18 Flow of Calcoin and Perpetuation of Calcoin Ecosystem

The diagram shows the Calcoin flow, where CLC Foundation evolves into a data & marketing tools provider for CAL partners in the ecosystem. This is one of the ways that the Cal coins will be collected into CLC foundation, and be distributed back to the members perpetuating the Calcoin reward system.

The followings are being considered to bring some coins back to the foundation:

- CLC Foundation plans to provide upscale health and disease management coaching services to its members with CAL charge
- A small percentage of the public reward coins can be deposited into the future pool, and can be used to ensure the coin balance remains healthy
- After all the foundation is a nonprofit organization, and donations in the form of Cal coins from the affiliates is a strong possibility
- When the Calcoin hard cap is reached (when the new issuance of Cal coins nears depletion), CLC Foundation may announce the total public distribution amount of CALs on the yearly basis in consideration of CAL's balance for the public distribution to guarantee continuous CAL distribution. That means that the level of rewards may vary from year to year depending on the balance of CAL.

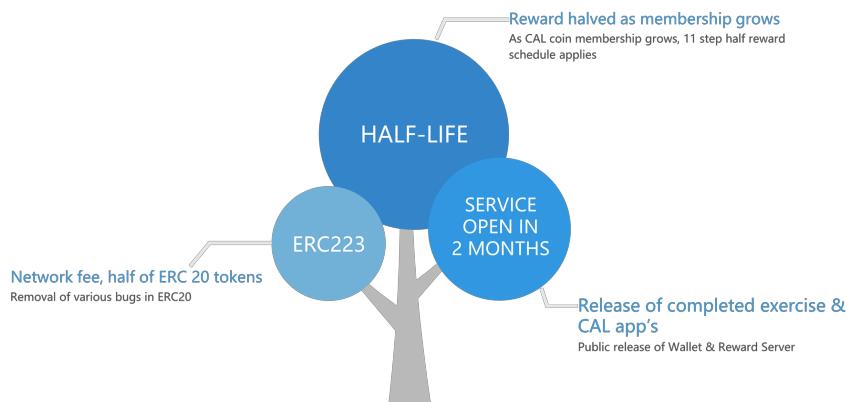
CLC Foundation commits to the perpetuation of the ecosystem, and considers it as one of the essential responsibilities.

3 Major Advantages of CAL

As shown in the picture below, the CAL coin has three advantages:

1. **ERC223:** The CAL coin is an Ethereum Token based on the ERC223 standard, which charges one half the transfer fee compared to other ERC20-based coins and will also solve many of the problems that the ERC20 had. It will also provide a better coin transaction environment.
2. **CAL Service Open in July 2018:** The first app with the CAL interface, Coinstep has been launched since April 2018. Calcoin Wallet and Reward Servers will be completed, and the CAL Service will be launched in July 2018 for all the CAL members everywhere. This is a very differentiating point of the CAL project, and it reflects that the CLC project has been endowed with the enabling team, and that the project has been well executed in advance.
3. **Half-Life Scheme of CAL Rewards:** As the number of CAL subscribers doubled, the CAL distribution algorithm is designed to halve the number of CAL reward coins, consequently the value of a CAL is expected to appreciate as well. This half-life arrangement takes account of the absolute cap of the CAL issuance, 10 billion CALs, and the amount of annual reward tokens as the member base grows.

Figure 19. 3 Major Advantages of CAL



Protection Mechanisms for the Investors

The following points are explicitly stated in this paper to maximize and protect the investors who will have participated in the Calcoin event:

- All foundation internal allocations of Calcoin will be locked out for one-year period after the event is over

- All investors coins will be put in escrow after the coin disbursement for two-month period to prevent a surge of outflow at one point in time
- All the allocations and execution of coins under the foundation control will be clearly made public on the annual basis to prevent any negative impact on the Calcoin market
- It is expected that Calcoin will be listed at one or more cryptocurrency exchanges around the world and its plans will be made available soon after the event is over

ROI Expectations of CAL

1. Enlisting of CAL at Crypto Exchanges:

CLC Foundation is planning to list CAL at one exchange during the first half of 2019, and it is a very concrete plan. It will be followed by other more mainstream worldwide exchanges in second half of 2019.

2. CAL Membership Expands:

Why do people download Calcoin Wallets? Because it is fun, lets us walk more, and gets us coins. CLC Foundation projects that as the word of mouth spreads, the acceptance of CAL will grow at an exponential rate: Everybody walks and everybody carries a smartphone. It is difficult to find reasons to walk without Calcoin Wallet.

3. The CAL rewards are halved:

AS the membership doubles, the rewards are halved according its predetermined schedule. (See Table 3 above)

4. As the rewards coins shrink, the value of CAL will rise.

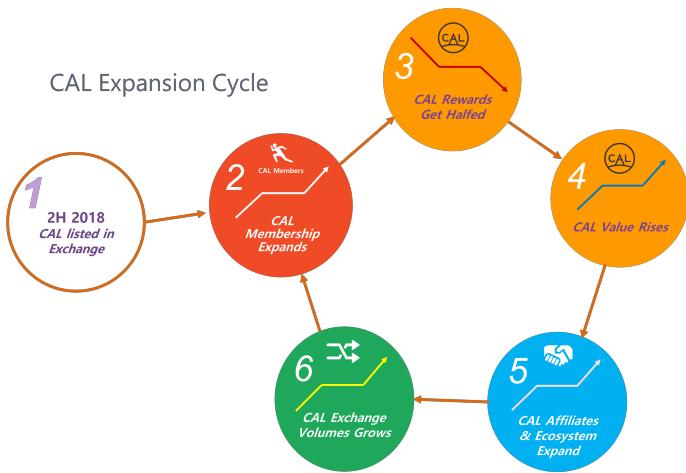
5. Why CAL Affiliates join the ecosystem?

The affiliates, by accepting CAL for products and services, will get a bigger customer exposure, and earn CALs in return. Again, it is hard to find reasons not to join the ecosystem for corporates in the health care & merchandise sector.

6. CAL Exchange Volume will grow.

As the CAL producer/consumer interaction synergistically doubles and triples, the trading CAL volume will grow exponentially. This completes a cycle, and another one starts.

Figure 20 CAL Dynamics Projected

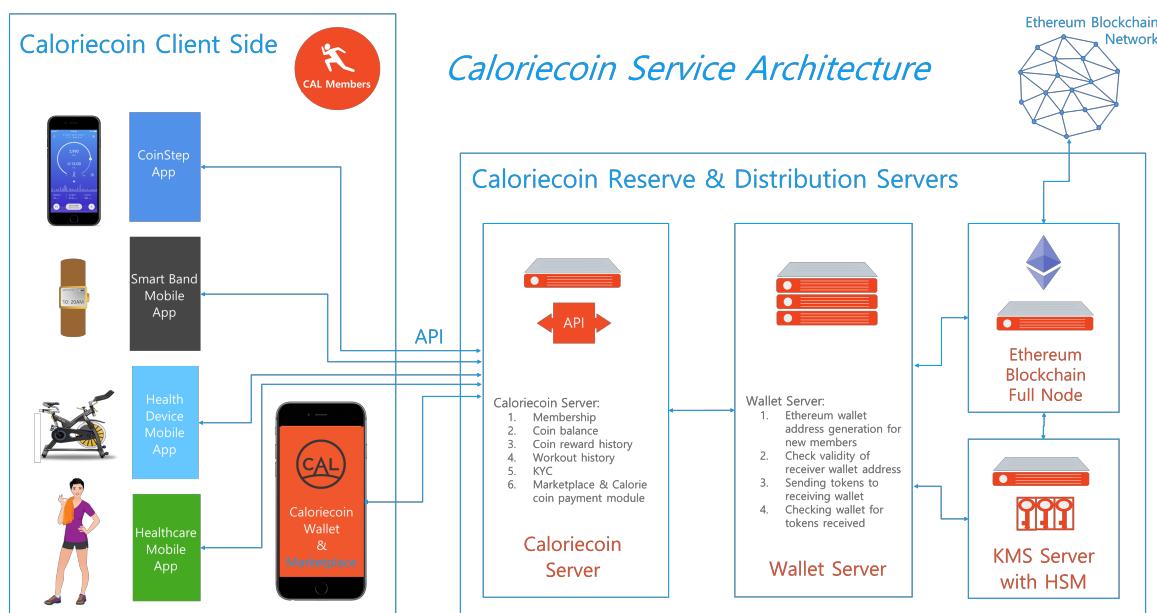


7. The CAL Architecture & Future Evolution

This section covers the Calcoin service architecture, and how Calcoin evolution is being planned in technology and business aspects.

Calcoin Service Architecture

Figure 21 Calcoin Service Architecture



Calcoin Client Side:

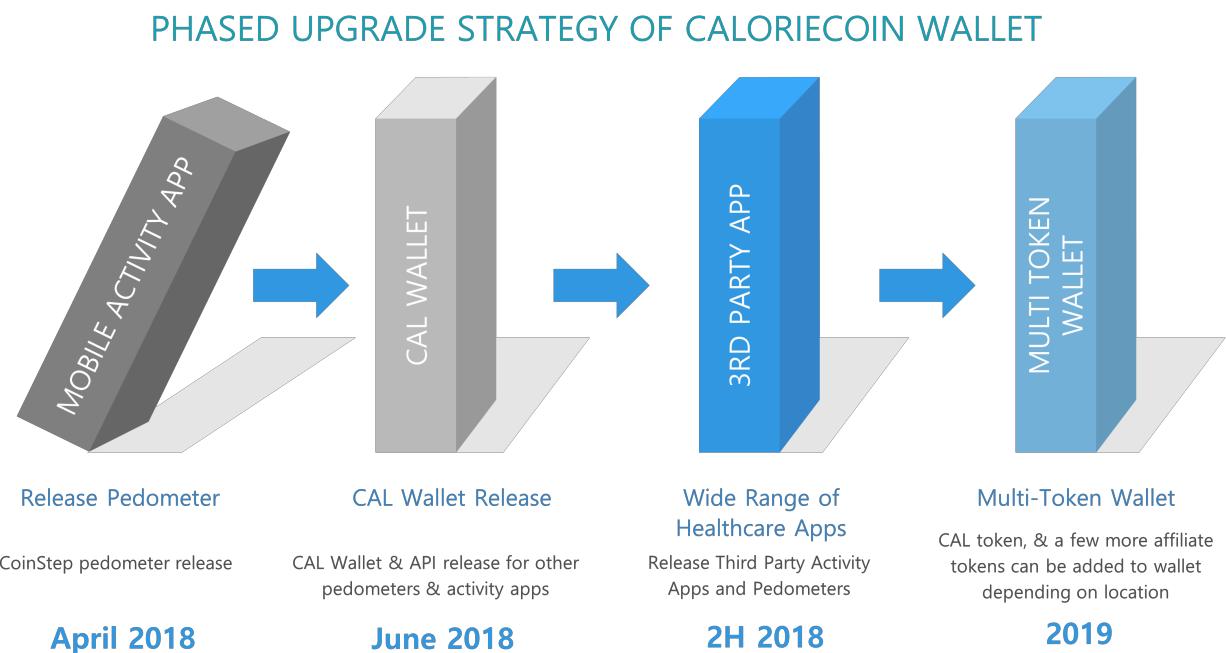
1. Calcoin Wallet can interoperate with a variety of pedometers & healthcare apps to guarantee versatility and universality of CAL
2. A set of open API's of the wallet will be available to partners
3. Calcoin Wallet has a marketplace and a Calcoin Payment Module. A variety of healthcare products and services available at the marketplace, and can be purchased in CAL.

Calcoin Reserve and Distribution Servers

1. The Calcoin Server, the Wallet Server, the Ethereum Full Node, and the HSM⁷-based Key Management Server will be the backbone of the Calcoin service.
2. Main keys of Calcoin operation will be kept in HSM equipment, and the key sharing of internal staff⁸ will ensure strong information security.

CAL Evolution Plan

Figure 22 CAL Wallet Evolution Plan



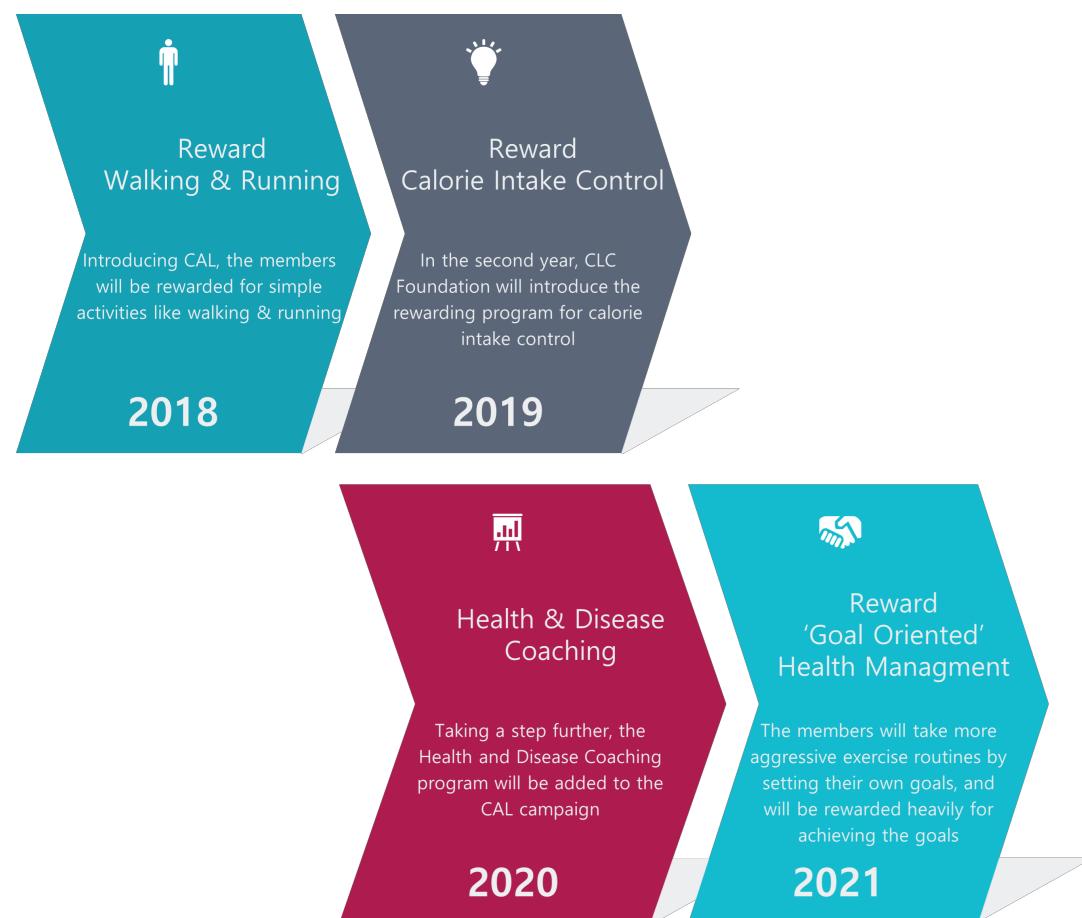
⁷ HSM (Hardware Security Module): secure storage equipment to store private keys safely with digital signing function inside

⁸ Key sharing of internal staff: multiple of internal staff keep the keys to ensure safe operation of Calcoin preventing a single individual's sole discretion

The above diagram shows how the Calcoin wallet and activity apps will evolve into an ecosystem of calorie control and health management in the near future.

The diagram below also shows how the CAL program will expand its functions and market coverage to entice the demography with goodwill and desire for longevity.

Figure 23 CAL Functional & Market Evolution Plan



Conclusion

The Dark Side of Economy, Where We Live in Now

When we buy a health insurance policy, we expect that the insurance company will pay for the medical bills when we get sick. The insurance company cannot influence us to do anything particular for our health with the insurance policy. The contract puts no weight whatsoever on what we do to improve our health. The insurance company seem to believe that we will do our best for health as long as we live.

But the reality is dark and sobering. First, we do not seem to know enough about health and disease as a society. Second, at personal level, we do not do enough to keep our health intact; we are not eating right and we are not mobilizing our bodies enough. Metabolic syndrome is so widespread that the national health budget is about to go bankrupt, and so are the patients and families. Our medical bills have been staggering, and so has our health insurance premium been. The saddest fact is that our health as a demography has been deteriorating, and a half of kids are obese. We call this “the dark side of economy”, and we have been living in the dark side of economy so far. There seems to be no end to this rabbit hole.

The Bright Side of Economy, Where We Want to Be

Our vision is to build a new paradigm of economy, what we might call ‘the bright side of economy’. There, people would be under a contract, a voluntary one, in which it stipulates that you will be paid for the workout you have planned and completed. You will be paid in CAL in our ecosystem. The contract will be written in Ethereum smart contract under the CAL Ecosystem.

In this bright side of economy, you work out what you have planned to improve your health, and you will be paid in CAL as you become healthier. Our goal is to assist and guide you to reach there. One example is your weight. When your target is to lose weight, you will get paid when you have actually lost weight. This could be one of the ways to reach to the best preventive medicine. We are hoping that your medical bill stays under control; and so will your insurance premium cost.

The National Health Plan, the Same Story Applies

For the national health plan, we could implement a similar program. When the national health plan recognizes that your health has improved, they would pay you according to the predefined schedule. This would be called “the personalized medical incentive plan”, where people would be paid incentives when they accomplish personal goals that they commit and contract with the health plan. This is in stark contrast to the current situation where you would be paid only when you get sick.

The Technological Innovations Have Made It Possible

The recent advancements of information technologies, most prominently of the smart phone, and of the blockchain & smart contract, have set the stage for the true amalgamation of this notion of the bright side of economy.

The bright side of economy can be implemented quickly and painlessly using the blockchain and smart contract technologies. That is our vision, and this paper is all about implementing this goal. We hope that every participant in the CAL Ecosystem will become healthier and happier in the long run with CAL.

8. The CAL Founding Team

The CAL Executive Team



Charles Chung
Founder and CEO, CLC Foundation

In 2015, Charles co-founded Blockchain Lab, the first company builder in Korea with focus on blockchain technology. Over the past 20 years, he has assisted about 30 startups from inception, and has been continuously creating new ventures for himself. His main interests have been in establishing new business models in the areas of electronic payment, electronic guarantee, authentication, and remittance.



Jay Ahn
COO, CLC Foundation

During his last decade, Jay has served as COO at CrossCert, where internet security, and public key infrastructure were the keywords. In the last two years, he has been very actively involved in developing new business models and teams in the blockchain arena.

He holds MS in Computer Science from the Ohio State University, worked as MTS in UNIX kernel at Bell Labs, and as director for UNIX server engineering team.



Charles Lee
CTO, CLC Foundation

Charles Lee is the cofounder, and the chief technology officer at CLC Foundation, and is leading the CAL coin development into the CAL community. Prior to joining CAL, he also founded and served as the president at iSoft, and as CTO at Future Systems. In the last couple of years, his main interest has been in blockchain and cryptocurrencies, and has been a key player in the company. He graduated from KAIST with computer science master's degree.



Hansu Ethan Lee
CLC Foundation, Director

Ethan is a director at CLC Foundation, and is leading the engineering team of CAL. Prior to joining CAL, he was the CTO at LinkZen, and he worked at Samsung Electronics as software engineer. Prior to that, he worked as a software developer at TG Payment Gateway Corp.

He holds BS in Computer Science from KAIST. Very recently, he has completed a Hyperledger project where he implemented the payment layer for a major credit card company in Korea.



Andrew Oh
Director, CLC Foundation

Andrew is a director in strategic planning at CLC Foundation. Prior to joining, he was leading the service planning team at TG Corp, and Hyundai Information Technology.

He graduated from KyungHee University holding Bachelor's degree in Computer Science. Very recently, he participated in a project for a major credit card company, where he implemented the payment layer using Hyperledger.



Lina Martini
Director, CLC Foundation

Lina has been actively working as Global Marketing Director of CLC Foundation. Prior to joining, she was leading the Marketing Department at Crosscert, as a Marketing Director. She graduated with BS from Coventry University in the UK and acquired a MS degree from Montpellier Business School in France.

Advisors



Youngduk Kim

BS in Computer Engineering, Seoul National University
MS in Information & Communication, POSTEC University
CTO at Interpark, and Gmarket
Head of Research Center at Lotte Information Systems
VP at Lotte Acceleration Center



Ben Hur

BS from Seoul National University
CTO at Interpark
CTO at eNet
CEO at Interpark Bizmarket



Sanghan Lee

Ph. D in Technology in Ventures from Kunkook University
eBay Korea
CEO at Market Seum
Head at Tion Soft Planning Department
Assistant Professor at Department of Wellness
Convergence, Sunchunhyang University



Chulhwan Kim

BS in Electronics from Seoul National University
Dacom Research Center
CEO at Gigalinks
Korea Country Manager at Music Genome
Head of KBIPA (Korea Blockchain Industry Promotion Agency)