MOECO
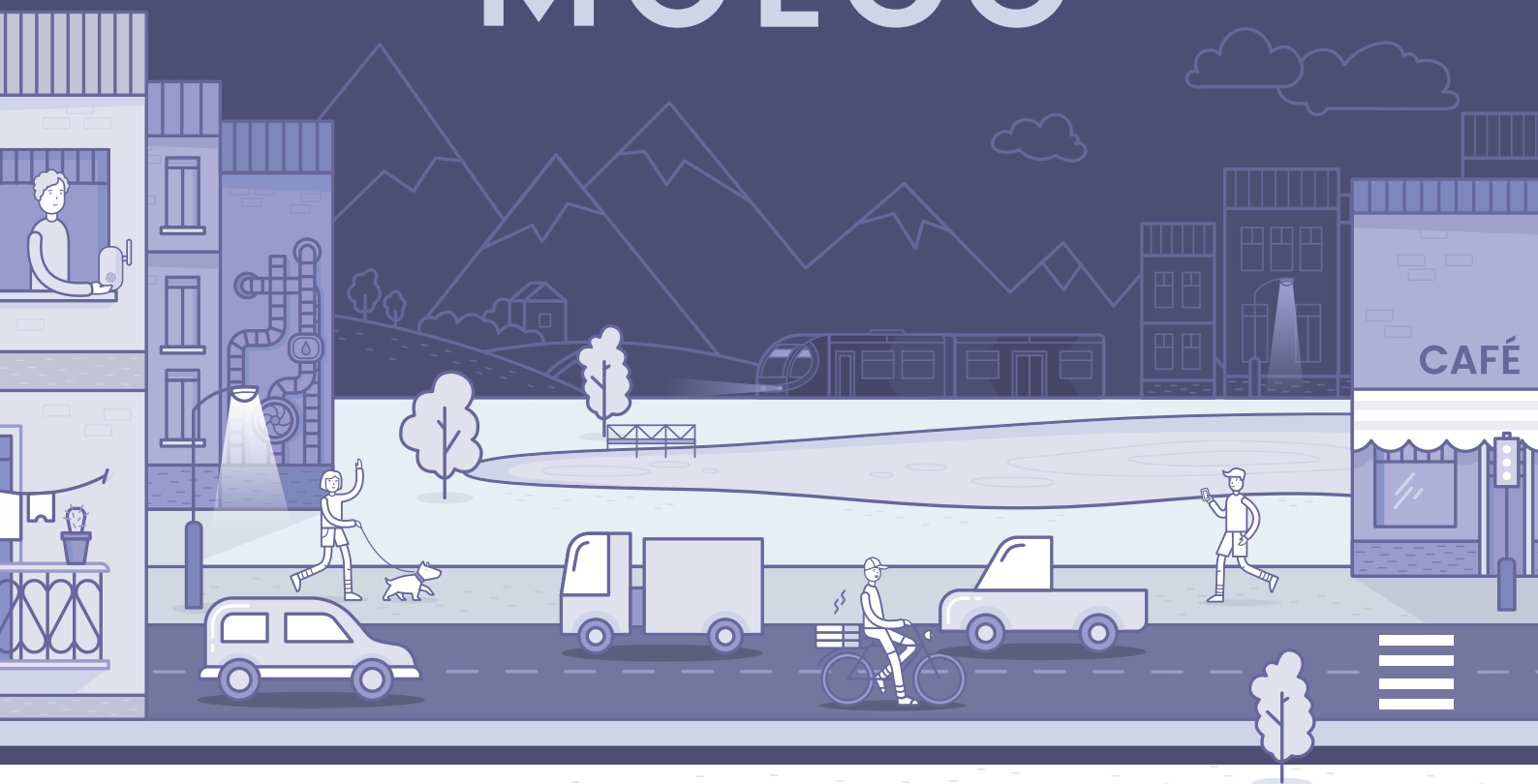
WHITE PAPER | v 0.9

WE BELIEVE

in a decentralized world where all interactions are based on sharing and mutual benefit.

We believe it is possible to provide global connectivity for all IoT devices.

We can do it.

At the moment, the appetite for broader availability of IoT data connections clashes with the lack of transparency and uniformity in the global machine to machine (M2M) connections market. Current solutions have certain apparent limitations: GSM is expensive and relatively power-hungry, and LPWAN (a wireless technology designed to allow long range communications at a low bit rate) consists of a large number of separate networks and lacks interoperability and consensus as well as virtually absent outside the city areas, so the infrastructure expansion suffers from «chicken and egg problem». Bluetooth has very small range (less than 10m) and a P2P topology meaning there is no way to create a local network of devices and thus no global IoT platform strategy at all.

The freshest solution to this problem is Moeco, a blockchain-powered platform designed to provide global IoT connectivity using multiple radio access standards.

The premise is simple: anyone can set up a gateway (router) and provide connectivity to any IoT device to earn MOE tokens. In Moeco economy, data transfers by any IoT device are paid for in MOE tokens. Blockchain handles data connections and ensures accurate billing. The total amount of MOE tokens is tied to the number of connections on the network, so the value of MOE grows as more IoT customers connect.

Thousands of owners who set up gateways at home and spread the word will help us keep our promotional costs low. No rent, no third party maintenance, no capital expenditure required. The result is a genuinely competitive marketplace that provides genuinely affordable connectivity. All IoT devices will work anywhere, enabling collection of large amounts of data, the best network coverage, and the best network utilization. For local IoT solutions, it means exciting new global opportunities.
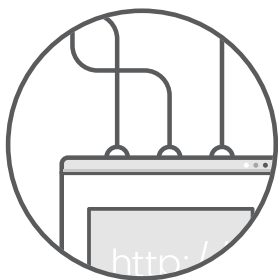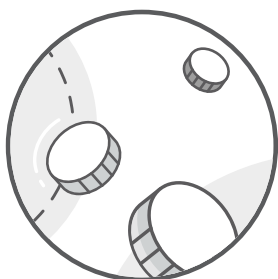
Blockchain brings trust to the decentralized system with many counterparts spread across the world.

Moeco will adopt LPWAN and Bluetooth Low Energy solutions to deploy limited scale test networks in a few major IoT-curious cities.

This whitepaper describes the problem, the technical side of the solution, and the applicable advantages of blockchain. It also explains principal use cases and maps the billion dollar IoT connectivity market.

CONTENTS

IOT MARKET OVERVIEW

According to the report «Machine-to-Machine (M2M) Connections Market[1] by Technology (Wired, Wireless), Industry (Healthcare, Utilities, Retail, Consumer Electronics, Automotive & Transportation, Security & Surveillance), and Geography – Global Forecast to 2023», the overall M2M connectivity market is expected to be worth USD 27.62 Billion by 2023, growing at a CAGR of 4.6% from 2017 to 2023.[1]

Out of the two continents, North America is one of the fastest-growing markets due to technological advancements, advanced infrastructure, and higher disposable income. The wide-scale adoption of M2M in several key industries, such as manufacturing, healthcare, Banking, Financial services and Insurance (BFSI), and transportation, along with automotive production, is the key factor supporting the growth of the regional M2M market.

Unfortunately, the current state of the IoT market poses a number of issues in the field of network availability, infrastructure solutions, and network deployment areas.

There are 3 connectivity solutions for M2M communication – GSM, LPWAN and Blue-Tooth Low Energy.

GSM IOT

Traditional cellular options, such as 4G and LTE networks, consume too much power and are not optimized to handle infrequent transmissions of small amounts of data (e.g. utility meters).

Cellular IoT is meant to meet the requirements of low-power, long-range applications. Cat-1 is the only fully-available cellular IoT option at the moment and represents an early push to connect IoT devices using existing LTE networks. While its performance is inferior to that of 3G networks, it's an excellent option for IoT applications that require a browser interface or voice services. The major advantage of this technology is that it's already standardized, and more importantly, it's simple to transition into the Cat-1 network from a traditional GSM network. The markets expect Cat-1 networks to take over as 3G technology sunsets.

Cat-M (officially known at LTE Cat-M1) is often viewed as the second generation of LTE chips built for IoT applications. It achieves the reductions in cost and power consumption that Cat-0 set the stage for. By capping the maximum spectrum bandwidth to 1.4 MHz (as opposed to 20 MHz for Cat-0), Cat-M targets LPWAN applications like smart metering where only small amounts of data are transferred.

Verizon launched the first US-wide LTE-M network, covering 2.4 million square miles, which the company says will accelerate IoT adoption in the country.

T-Mobile is taking on Verizon and AT&T in the IoT with new data plans that offer their service in package with Sequans LTE Cat-1 modules.

The carrier launched IoT Access packs[2], a two-tiered offering starting at $20 per year per device for 5MB of monthly data. The price drops to $6 per year per device after the first year. An unlimited data plan at 64 Kbps is also available at $25 per year per device, and for a limited time customers can get $5 off the first year for each device. However, the new IoT networks still do not have the full coverage and the pricing is far from optimal. Traditional GSM providers have a very expensive infrastructure. Also there is a need of a SIM card to be installed in the device – which increases the device production costs and consumes time for the integration in case of dispatchable cards or limits the area for built-in prepaid modules.

LPWAN

LPWAN (or LoRa) – short for "Low Power Wide Area Network – is widely used for IoT connectivity in several European countries (nationwide, for specific applications and pilot projects and/or moving beyond local deployments). In other regions across the globe (from Asia-Pacific to Africa), the LPWAN standard is taking an increasingly large share of the connectivity market.

LPWAN is often a choice for private IoT networks as well as community-based networks like The Things Network. It is predicted that by 2022, private LPWAN networks will make up two-thirds of the whole. It has a great coverage of 15 km per one LPWAN gateway and outstanding power-consuming characteristics. It is a standard designed for IoT applications considering the requirements and challenges imposed by M2M communication.

With a thriving global ecosystem and tens of thousands of networks worldwide, LPWAN has captured a significant share of the market.

The LoRa Alliance has grown to over 500 members in the past two years, so new breakthroughs, such as LPWAN backscatter using 1000X less power with 10-cent sensing devices transmitting up to 1 kilometer, may soon make the promise for billions of IoT devices a reality.

LPWAN standard-based networks are already deploying worldwide. A complete coverage of nearly all EU countries is achieved or underway and most major network operators including Bouygues, Orange, KPN, Proximus, and Swisscom are deploying LPWAN gateways in thousands of towers, driving new roaming standards, leveraging unlicensed spectrum and aggressively targeting enterprises.

In Asia, SK Telecom has one of the first commercial public LoRa networks. SoftBank (ARM) with its partner Activity is deploying LPWAN services in Japan. Public LPWAN networks will soon cover North America as Comcast's machineQ service is aggressively expanding to 20 major US cities.

However, at the moment, LoRa networks lack coverage and mostly work separately, so the ecosystem is fragmented and not yet coordinated. Private networks are underutilized in terms of the capacity of devices they could have served.

BLUETOOTH LOW ENERGY

According to the Report «Bluetooth Smart/Bluetooth Low Energy Market: Applications (Consumer Electronics, Healthcare, Sports & Fitness, Retail, Automotive, Security); By Technology [Discrete Modules, Integrated Modules (Single & Dual Mode)] – Forecast (2015-2020)»[4], the BLE market is estimated to reach $8.4bn by 2020 at a high CAGR.

Bluetooth Low Energy (BLE) or Bluetooth Smart is a WPAN technology launched based on the Bluetooth v4.0 specifications introduced first in 2010. The specifics of the BLE protocol lie in its reduced power consumption providing longer battery life to the device in which it is embedded. According to a recent market study from IndustryARC, a high demand for the BLE facilitated by its rapid penetration into electronic devices will ensure the market revenues reach $10.1bn in 2020 growing at 22.4% during the forecast period.

Currently North America is the largest market followed by APAC and then Europe, according to the insights from IndustryARC. The Asia Pacific is experiencing a high growth rate of 32.4%, compared to other geographic regions during the forecast period. Although the market has a significant demand and several growth factors, it will face challenges like security vulnerabilities: e.g. sniffing, optimization for installations, and bitrate for large file transfers.

Although there are efforts led by Google Android Things to build up a platform for IoT supporting the BLE, there is currently no platform that would support all kinds of devices especially not pairing with the phone.

BLOCKCHAIN
AS A SOLUTION

Facilitating a decentralized world in which everyone is benefited is one of our highest priorities. The connectivity should be global, and blockchain solves both problems of global connectivity-coverage and billing.

A trustless distributed blockchain technology is designed to build a decentralized crypto-economy, where billing and payouts are done instantly and transparently. No additional administrative or infrastructure set up costs are involved. No rent and no service maintenance costs are necessary, and the network is up and running thanks to both the technology and the community. Global blockchain enables global coverage. Thus a blockchain-based solution cuts the costs of service and increases the coverage compared to private vendor solutions.

MOECO

Moeco is a blockchain-based platform that provides network access to devices via gateways. Devices pay tokens on per-connection basis and gateways receive tokens for data transfer.
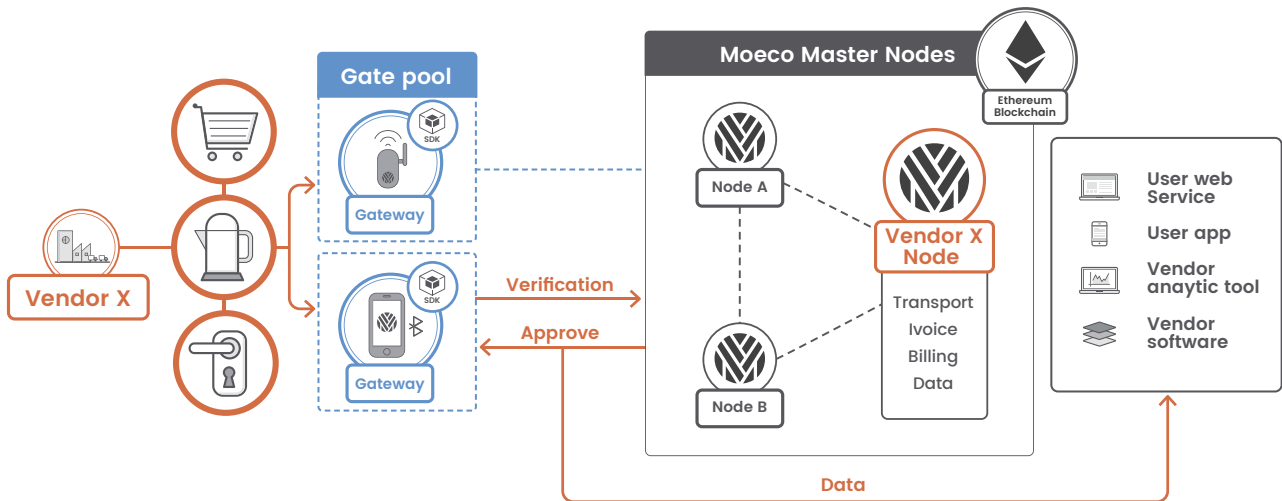
Each device is tied to its vendor's wallet for easier billing and data processing. Vendors collect money from users and convert it into tokens.

Gateway owners provide connectivity to devices and receive tokens from the bounty pool for data transfers carried through their gateways.

MOE tokens (hereinafter also referred to as "MOE") represent all the connections made through the Moeco platform. MOE is the sole payment method between vendors and gateway owners.

A vendor-registered device sends data to vendor-owned IoT platforms via gateways. The gateways verify the data transfers with the vendor's masternode.

While on the vendor's masternode:

- Transaction blockchain logs all the data connections and data transfers.

- Billing blockchain issues invoices based on the information from the Transaction blockchain.

- Ethereum blockchain processes and signs the payments.

- Payment blockchain logs data of the processed payments.

- Masternode approves subsequent data connections between the devices and the vendor networks.

HOW IT WORKS

The goal of the system is to deliver a data package and transfer a payment to the Gateway Owner's Wallet. The data package transportation and payment validation are both taking place in the Moeco network based on the Exonum blockchain framework. All payments are done with ERC 20 Ethereum Moeco tokens in the Ethereum network.

First of all, a data package has to be delivered via the Transport blockchain. The Gateway is creating a transaction with the encrypted MineID, Vendor's masternode validates the transaction, decrypts MineID and accepts the transaction, then the Gateway is constantly searching for accepted transactions marked with its own GateID - in case of any, the Gateway transfers the encrypted package to the Vendor's server.

After some transactions have been accepted and a Transport Block is signed in the Transport blockchain by the majority of Masternodes, the Masternodes are creating a new block in the Invoice blockchain. Each record in the Invoice blockchain represents an Invoice from the Gateway to the Vendor for a transport of the transactions that have been processed by the Moeco network.

Every invoice has an Invoice Total" that has to be paid by the Vendor, as well as the list of transactions for double check purposes. The Gateway Owner's Wallet that should receive the payment, and the Vendor's Wallet that should make the payment. The Invoice Total is calculated by the Masternode based on the price list information. The price list processing algorithm is described below.

Masternodes are creating invoice records until all the accepted transactions in the transport-signed block are linked to a particular invoice. Masternodes confirm invoice transactions made by other Masternodes by checking the Invoice Total against the transport transactions and the price list information. That helps prevent invoice fraud ifsome Masternodes have been compromised. Once there are no transactions left in the signed transport block that are not linked to any invoice transactions, the Invoice block will be signed by the Masternodes.

Once the Invoice block is signed, the Masternodes will create a new block in the Payment blockchain. Each transaction in the Payment blockchain should contain an Invoice Transaction Identification and Ethereum Transaction Identification. Each Vendor Masternode checks all unpaid invoices of the Vendor,processes the outstanding payments in the Ethereum network, and creates a new transaction in a new block of the Payment blockchain. Other Masternodes check the Invoice Total against the total amount of ERC20 Moeco tokens received by the Gateway Owner's Wallet in the Ethereum network, subsequently confirming or rejecting each transaction in the Payment blockchain.

The Payment block has to be signed by Masternodes once all invoices are paid. If some of the invoices still remain outstanding and a new Invoice block has been signed, then

all the unpaid invoices will be marked with the Delayed Payment attribute, the Payment block will have to be signed, and all the unpaid invoices from the previous blocks will have to be paid within a new Payment block.

If an invoice has remained unpaid for more than X days, Masternodes will remove the specific Vendor's device from the Device Vendor Mapping. Following that, the Gateways will not be processing data packages from the Vendor's device in order to avoid increasing the Vendor's debt any further.

UPLINK
FLOW

1. Vendor server creates an uplink message for a DeviceID at the Vendor's master-node.

2. Masternode creates an uplink transaction request in the Blockchain, each uplink request gets marked with the gateways which already processed this DeviceID before.

3. Gateways check the Transport blockchain for uplink requests with the corresponding GatewayID.

4. If an uplink request for the corresponding Gateway is found, then the Gateway stores the uplink message locally.

5. Gateway waits for the specific device with the corresponding DeviceID to send the data.

6. When the Device sends the data, the Gateway responds with the uplink message and confirms the uplink transaction request.

DOWNLINK
FLOW

1. Device encrypts the data.

2. Device encrypts the MineID.

3. Device creates a package with DeviceID, encrypted MineID, and encrypted Data.

4. Device broadcasts the package.

5. One or several gateways receive the package.

6. Gateway checks the DeviceID against the local device blacklist.

7. Gateway checks the DeviceID against the device blacklist pulled from the block-chain on an hourly basis.

8. Gateway checks the DeviceID against device-vendor mapping from the block-chain.

9. Gateway initializes a new transaction in the blockchain with the DeviceID and the encrypted MineID.

10. Masternode checks for initialized transactions.

11. Masternode checks the GatewayID against the Gateway blacklist from the block-chain.

12. Masternode checks the DeviceID against the DeviceID blacklist from the blockchain to prevent fraud.

13. Masternode checks the DeviceID against Device-Vendor mapping.

14. Masternode makes an attempt to decrypt MineID.

15. Masternode validates the decrypted MineID.

16. Masternode accepts the transaction.

17. Gateway checks the blockchain for accepted transactions with the corresponding Gateway Id.

18. Gateway sends the encrypted data to the corresponding Vendor's server.

ECONOMY OVERVIEW

Moeco revenues are generated by the end users who purchase devices that consume connections. A device pays tokens to a pool which sends the tokens to a node that, in turn, sends the device's message to a specified destination.
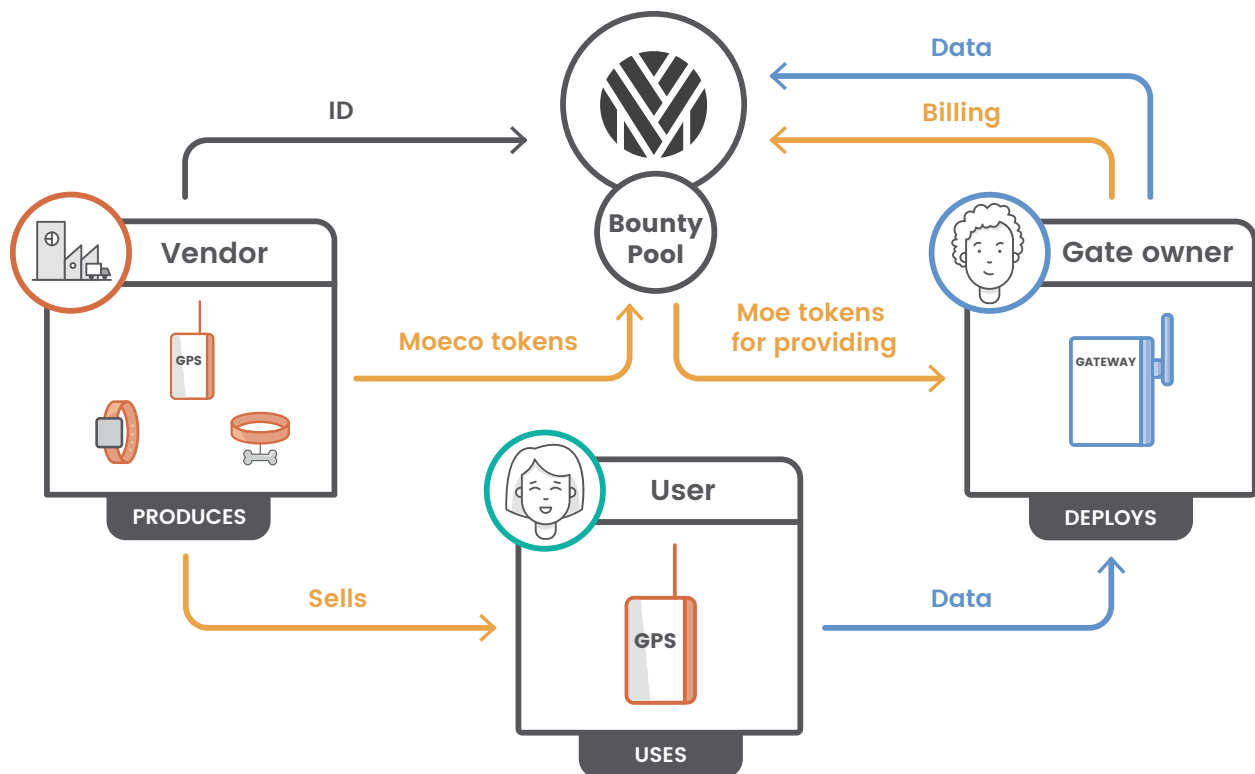
Vendors manufacture devices and add their IDs to the Moeco platform wallet. Users purchase these devices and start using them. Gateway owners provide network access for the devices and verify their IDs against the Moeco platform. The users don't pay their data bills directly: instead, the device manufacturers on the Moeco network pay tokens to the participating gateways. The vendors declare their maximum acceptable cost of connection while the gateways declare their operational cost: both numbers are logged on the ledger. Connections are allowed if the gateway's declared cost is within the vendor's accepted range.

TOKEN DESCRIPTION

Why are MOE tokens valuable
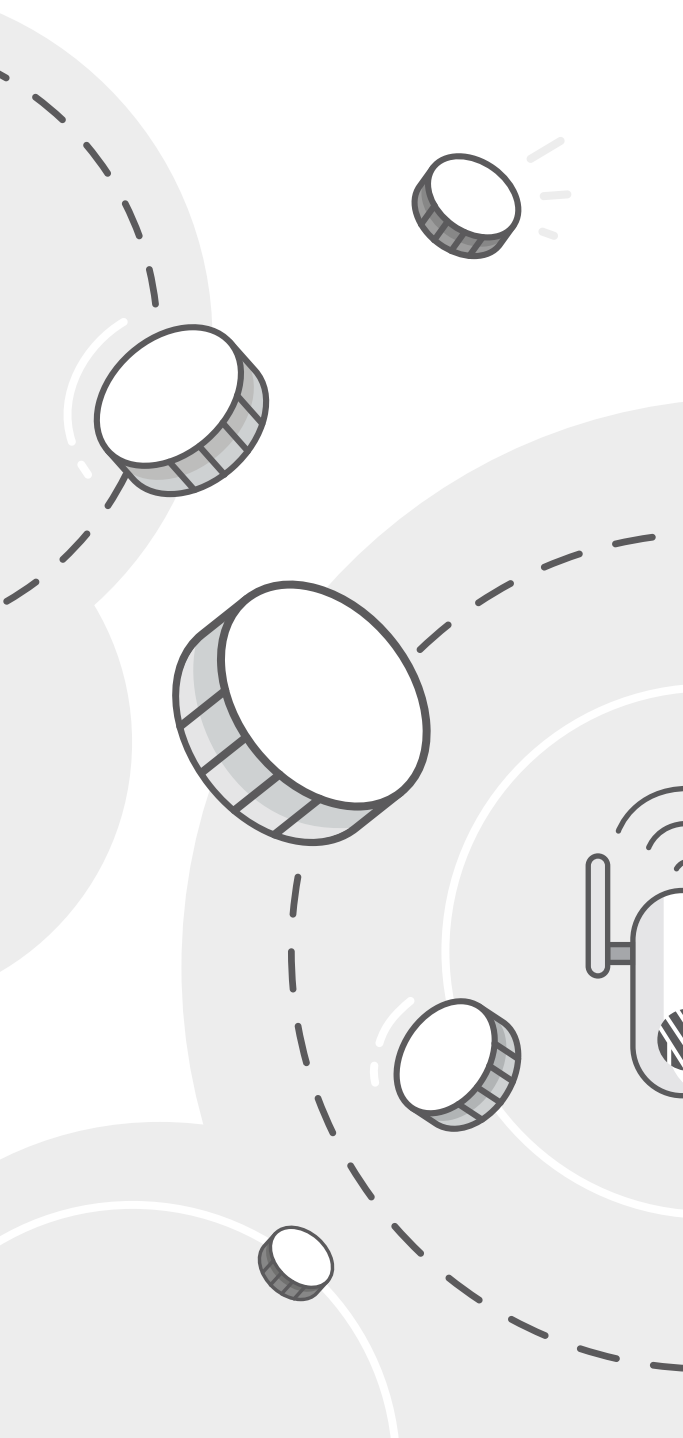
Pricing

What is a bounty pool

Moeco foundation committee

MOE tokens represent all traffic and connections inside the Moeco Platform. The cost of a token is directly linked with the amount of connections done. The token economy is based on the exchange of MOE tokens between the Internet consumers (devices that are owned by users) and the Internet producers (nodes that are owned by users).

The tokens are directly used for the following:

1. Users use tokens directly or via device manufacturers, or dealers, or service providers to pay for the connections used by their device.

2. Node owners receive tokens from a bounty pool of connections that were done through their gateways for a certain time.

WHY ARE MOE TOKENS VALUABLE

Moeco is building a decentralized last-mile infrastructure for IoT and other connections using MOE tokens as a power of motivation. An alternative to the Moeco technology would be traditional service providers and a number of local companies. One may consider MOE network as an alternative to a mobile network. Think about the price of a mobile communication cell and how much money a service provider has to invest in the infrastructure.

A typical LPWAN gateway handles up to 1000 connections, and there are 5.3 billion consumer devices in IoT in 2017. If one device pays $1 a year, it makes at least $5.3bn. For a city of a moderate size, one can consider at least roughly the same number of IoT devices as there are number of people. Smart meters are to be used everywhere, smart light pods, smart wearables. Each city promises millions in potential revenue.

On the other hand, one should consider the likelihood of the following scenarios:

1. Lack of gateways. There is no gateway in the area. Early adopters set up their gateway and get a lot of benefits.

2. Enough gateways. Millions of tokens from devices go to gateway owners.

3. Plenty of gateways. Most gateways are nearly economically efficient, and some people simply set up gateways for their own benefit, getting enough of a reward to cover their electricity bill. The same occurrence happens now with BTC mining using general CPU.

Actually, it's a win-win situation. With enough economically efficient gateways, a closely equal and balanced competition gets a user the lowest possible price for the infrastructure. Sometimes the price can even be lowered due… to people following the same logic as in the usual mining process – it's not the initial investment that counts but a steady profit.

Each time the end user purchases a device that uses Moeco for connectivity it adds up to Moeco revenues. A device manufacturer uses tokens to pay for connectivity and sends the tokens to a pool which transfers the tokens back to a node that, in turn, transmits the device's message to a specified destination.

As the number of the devices and connections grow, the token value will equally grow due to a limited token supply. At the same time, the token turnover increases in speed, thus creating a rapid pool refilling and redistribution cycle that increases the token value even further.

PRICING

Connection prices are set by vendors. The granularity is the device. A vendor may add up any number of same-priced devices to a device pool. The device pool data with the prices and the IDs of the devices is added to the Pricing blockchain by the vendor. Once a connection is made, an Invoice is formed and sent to the vendor based on that information. Connection prices may vary in time, so invoicing and billing are done based on the prices that were valid at the time of the connection.

Pricing data is open to any gateway owners who may choose to accept or reject it. By initiating data transmission to a vendor's Masternode, the device owner accepts the vendor's price.

The gateway owner also publishes the minimum connection price it accepts for a connection. This price is added to the Pricing blockchain along with the gateway's location and technical characteristics. Vendors may use this information to make sure that their devices are served. It may also be useful as an indicator to other gate owners and to benefit the open market.

If the gateway owner has published the price higher than the vendor's connection price and he still accepts the connection, then he is paid the vendor's price. If several gateways accept the connection, then the first one whose initiating transactions are accepted in the blockchain gets the tokens.

WHAT IS
A BOUNTY POOL

A bounty pool works like a mining pool for bitcoins – everyone is able to mine BTC by calculating hashes. A bounty pool ensures that everyone can get MOE tokens by setting up a gateway and providing connectivity.

Connection price is provided by a gateway where 10% goes directly to the gateway, 10% goes to the Moeco Foundation, and 80% goes to the bounty pool.

There is a minimal connection price predefined by the Moeco Foundation to regulate exploit when a very large pool of devices connect via a large amount of gateways that belong to the same user to get benefit from the mining pool.

MOECO FOUNDATION COMMITTEE

The Moeco Foundation Committee regulates the acceptance of the protocols and hardware for gateways in such a way that only the approved gateways receive an additional bounty for being part of the network. This is done for two purposes: scam regulation (when a user sets up cheap useless gateway just to get a bounty), and adoption of new technologies and protocols.

The Moeco Foundation Committee membership and voting:

- Voting will be available for anyone who has at least 10,000 MOE tokens.

Voting serves for:

- Approving expenses for new SW development.

- Approving expenses for the Moeco Foundation team.

- Approving new protocol adoptions for a region (bonus MOE tokens).

- Approving new hardware adoptions for a region (bonus MOE tokens).

- Approving protocol and hardware retention for a geography (thus no more bonus MOE tokens).

- Setting up a minimal price for a geography.

- Setting up a hard minimal price for any geography.

Voting is done via blockchain by sending a small amount of MOE tokens to a certain address. Anyone who has more than 10,000, has 1 vote. Those having more than 10,000,000 MOE, have 100 votes each. Pooling is acceptable.

The Moeco Foundation itself has 100 votes.

ROLE OF GATEWAY OWNERS

Motivation of Early Owners

Table of comparison to traditional business models & technologies

A hardware infrastructural level are the gateway owners. Gateway owners are crucial to the Moeco network. They use low-priced network stations to enlarge the network coverage while simultaneously receiving a percentage of every connection's worth. This is the major part of the community – a smart household would benefit greatly from owning a private gateway and all the while acquiring an extra income. A large-scale user (like a skiing resort, city or a factory) can set up a network that can serve the whole area around them.

As the device manufacturers get the opportunity to produce affordable devices, service providers can deploy access points using low-priced and effective network gateways. Any individual is able to purchase and install a gateway in an apartment or even outside. This kind of user is a gateway owner.

If the gateway is active and exchanges data with devices inside the network, the gateway owner acquires tokens. The more gateways were owned and traffic was provided – the more tokens will be received.

A gateway can be purchased as a boxed and assembled product, and can be easily obtained and assembled by a person with no special knowledge.

Gateways are allowed to compete for users via Quality of Service. This Quality of Service does not go into economy, but the Moeco Foundation will develop a software that can indicate QoS of a particular gateway via an analysis of blockchain records.

MOTIVATION
OF EARLY OWNERS

The economical operational model will be stable in 1.5 years. It will represent the open market with weak competition and stable income for gateway owners.

Most profit for gateway owners will come from the bounty pool. Gateway owners will be able to compete via QoS and through adoption of new protocols and hardware.

During the first years, a gateway owner's' income will be relatively high due to the initial commitment of tokens to the bounty pool, motivating early adopters to set up more gateways. These tokens will be issued and committed during the ICO will serve the purpose of setting up an initial coverage. The amount of tokens for that will be 15% of the total token supply. These tokens will be uniformly vested to the pool on a weekly basis after the official launch of the open beta test. Afterwards the bounty pool is replenished by tokens contributed by devices as well as yearly emission until the market is settled.

Gateway owner

TABLE OF COMPARISON TO TRADITIONAL BUSINESS MODELS & TECHNOLOGIES

|	Bluetooth	WiFi	LoRa	2G 3G	MOECO
Range	Low	Low	High	High	High
Battery life	High	Low	High	High	High
Price	Low	Low	Low	High	Low
Self deployment	✓	✓	?	✗	✓
Device Management	✗	✗	?	?	✓
Open source	✗	✗	✗	✗	✓
Multiple last mile protocols	✗	✗	✗	✗	✓
Decentralized	?	?	✗	✗	✓

PLATFORM BENEFITS

No rent, no maintenance, no capital costs

Competitive marketplace

Global coverage

New business opportunities

SMART
DOG COLLAR
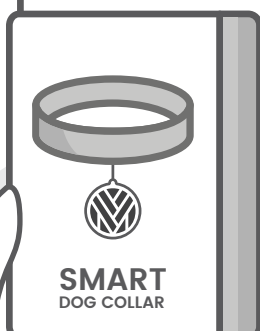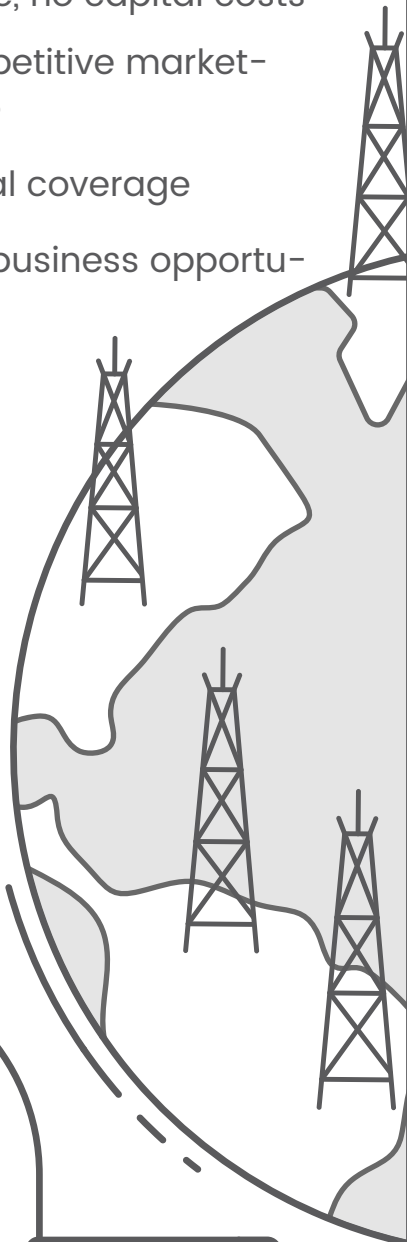
NO RENT, NO MAINTENANCE, NO CAPITAL COSTS

Traditional GSM operators build up cellular networks. Cellular networks require GSM LTE base stations setup. One station costs about $100k[6]. Additionally, operators pay rent to the land/building owners. It varies based on the location and additional legal regulations. Finding a spot for a base station in the city takes some time and money, and so does choosing a spot for the best coverage.

Once a base station is up, it needs to be maintained. Special crew of field engineers is hired for that. They do regular check-ups and repair broken units.

Moeco abolishes all of those costs. Gateway owners set up gateways on their premises and rent is not an issue for them. They perform all the maintenance themselves like bitcoin miners who devote their time to keep the mining hardware running.

Capital expenses are also born by gateway owners - they buy or build hardware on their own and set it up investing their time and money. Moeco as a business only covers operational costs, issuing tokens to the gateway owners.

Moeco solves the problem of optimal coverage by using open market - if there is a high demand then gateway owners see that via blockchain and increase the supply.

COMPETITIVE MARKETPLACE

Moeco allows anyone to become a gateway owner. We expect the community to adopt the idea of low-priced, fast, and profitable IoT connectivity with global coverage, and start earning on the gateways. There will be early adopters and investors who want to earn more than the gateway price + electricity + Internet. Same thing as when bitcoin emerged. It is nearly impossible now to be part of a cellular network and own a base station. It's fairly hard to be part of a LPWAN network, but Moeco lowers the entry to the market. Buy the gateway, download the software from Moeco – and you're online.

The benefits that the Foundation gives to "special" gateways and the bounty pool system encourages network development, hardware upgrades, new protocol adoptions, and quality of service.

Open and competitive market guarantees the lowest possible price for the customer in the long run, bringing in more vendors which leads to a higher Moeco token adoption rate.

GLOBAL COVERAGE

By its very nature, Moeco is designed to provide the best-in-class connectivity solution. As it is receptive to both current and future standards, it can be reused for multiple purposes while having only a single coverage layer over a certain area. Deploying new sensors and adding them to the network is extremely easy with Moeco. All you need is to add them to the device ledger.

Be it a BLE or an LP solution, providing coverage for any kind of sensors and deploying network solutions can be done from a single administrative suite.

The internal mechanics of the economy provide all the possible benefits to the first gateway installed, and while doing so, it attracts competition to mine the tokens in turn. That creates a situation where complete coverage is good for every participating party and spacing out the gateways makes the most economic sense.

Setting up Moeco in any particular area requires no capital investment and provides the means to obtain sufficient and financially viable coverage.

NEW BUSINESS OPPORTUNITIES

Imagine a local service provider that designs a great cloud service for its network. Optimized code, good design and interface. Unfortunately, it can't go global – other service providers have designed their own cloud services.

Another possible case is a local company in Italy that tracks dogs via GSM modules,has a discount from a TIM operator and uses vendor-specific API and services. If this company wants to expand its business into China, it should spend a lot of time negotiating with China Mobile (yes, in Chinese) and switching to another API.

Moeco allows building up global businesses from the start. Providing global connectivity, global coverage, and based on open-source, Moeco is very developer- and business-friendly. Any company may start doing business locally and then expand.

Using Moeco helps startups to attract investments from venture funds as scalability is no longer an issue. Moreover, new niches in Big Data processing emerge. As an example,global collection of weather data from meteo stations enables precise weather forecasts that are useful for agriculture and even for people deciding whether or not to bring along an umbrella.

LPWAN USE CASES

- Ski resort

- Resource management

- Creating smart traffic flow

- Agricultural

- Smart city

SKI RESORT

Imagine enhanced safety with Moeco. While visiting a ski resort or a nature park, you're always under an increased threat of emergency. So far, providing assistance in such vast territories has been quite difficult due to the need to locate the injured person, in many cases having no connection and only being presumed in danger after a certain time period. Moeco can change that. Any large-scale resort, trail park or any kind of natural attraction can afford to purchase just a few base stations (and skiing resorts, being situated together, can share the costs) and achieve coverage all over their active area.

After doing so, they can provide free or paid emergency rescue boxes to their clients. Each box contains a chip and can connect to any Gateway anywhere. Should a person find themselves in danger of an avalanche, trauma or otherwise, they can activate the device and call out for help with the exact coordinates known. That brings in a whole new level of lifeguarding to any outdoor adventure.

RESOURCE MANAGEMENT
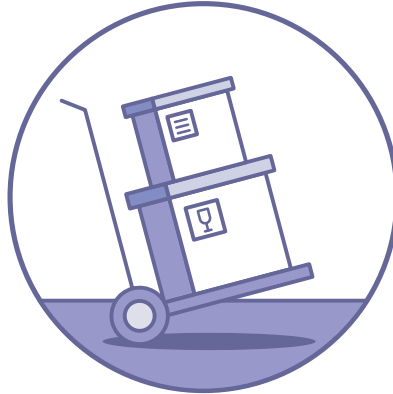
Accounting for resources is one of the greatest challenges we face as a civilization. Starting with water – the most precious and irreplaceable fluid. Moeco can make accounting for every drop easier than ever.

A municipality, a plant or even a household may install a LoRa-enabled measurement device, which will last years using electricity efficiently. It will send all of the data instantly to the Moeco system, making this data immutable and secure. Frequently updated data can promise a better water usage approach. Water flow controls can be automated too. Doing so leads leads to a dramatic increase in the resource efficiency, along with lowering costs and operating on a schedule. That is just a fraction of what Moeco can do for a city or a country.

CREATING SMART TRAFFIC FLOW
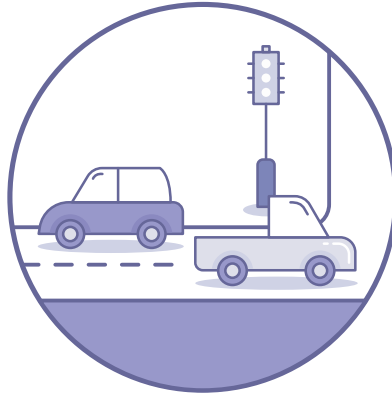
Whole cities and their infrastructure depend on the correct traffic flow. However, traffic control systems automation is not yet at the stage where it should be. With ultra-low power sensors and base stations providing a large coverage area,, we can make sure that traffic flows in the most suitable manner: traffic lights virtually "talk" to each other, every car is accounted for and the time to reach your destination becomes absolutely optimal no matter the conditions. Moeco can ensure every participant is granted the best traffic conditions all while the city saves on energy, transportation costs, and municipal services.

AGRICULTURAL

Herding livestock is a hard business. Especially in northern territories where animals may roam free, like reindeers. Losing each one is a blow to any farm, and keeping track of them is currently quite difficult for farmers – using GPS trackers and conventional connectivity methods for this is a highly specialized task. Usage of LPWAN standards will help cut costs on herding and tracking the cattle dramatically.

Placing a chip priced about $1 onto every animal and installing base stations in collaboration with other farmers can create a system where everyone knows whom a particular animal belongs to, along with its whereabouts at any given moment. Not only herding – this solution can also help optimize the whole growth and production cycle at the farm.

SMART CITY

Moeco's plans are to establish a solid infrastructure based on OEM Moeco solutions - LoraWAN gateways, each cover up to 1500 devices simultaneously. We estimate an average city at being 40 km in diameter, and 1 million inhabitants may have about 10,000 gateways, enabling 100 times the full coverage of any place in the city with 10 times the gateway availability compared to now. Moeco also develops a masternode software that is able to receive and validate messages sent through the Moeco protocol. One masternode is able to handle up to 2,000messages per second, thus handling more than 1 million smart devices such as lamp posts.

Moeco's partners and local authorities can help promote a new value for a smart city. Moeco requires no setup fee for a smart city infrastructure, and introduces a very competitive pricing. A local government authority may impose any regulations on gateways. Moeco offers a protocol and a software for free, driving collaboration with local companies which implement and support smart city solutions. The smart city case enables a lot of devices empowering the economy.

The gateway coverage and profit is ensured by a special bounty fund established for Moeco pioneers. The main goal of the bounty fund is to support early gateway owners before the amount of smart devices will reach a gateway payback point.

Moeco framework is capable of supporting most of the LPWAN standards and chip technologies such as LoRaWAN and Sigfox. Backed by the trustless distributed blockchain technology, Moeco is focused on both: cutting the costs of smart device maintenance, and increasing the coverage as compared to private vendor solutions.

Early-bird device manufacturers benefit from gateway owners who are motivated by crypto-economy, token growth and pool bounty system - thus ensuring the demand for the devices from the gateway owners which might be compared to BTC pioneers with their bitcoin mining rigs.

Connection cost is a significant part of the device overall cost per year, and the chip cost increase is small, thus manufacturers earn more and users pay less. Partnering with large cities allows Moeco to have an initial PR campaign, usage statistics and economy starting point.

BT LOW ENERGY USE CASES

Passive crowd counters

Collecting big data
from smart meters
all over the world

Logistics

Traffic meters

PASSIVE CROWD COUNTERS

In the age of personalized advertisement, timing and feedback have become the most important concepts in the supply chain. Say you have an event where you distributed branded T-shirts on the first day and would like to count how many of them were actually worn on the second day. Another case – event organizers may want to estimate the number of visitors to each of the booths. Traditionally, the infrastructure for this is (or is not) provided by the venue. If it is, then each venue would have its own way of presenting such information and its depth.

Each shop has anti-theft systems, but not each one uses them as traffic counters. Also, beacons might be deployed inside the shop, for example, in front of a shelf with a new collection. Counting traffic saves money on marketing and allows to assess staff performance.

Moeco has a positive side effect of attracting people to shopping malls to provide a BLE gateway coverage inside, at the same increasing the time the gateway owners spend at these malls. Another important advantage is for non-stationary events – you can't always rely on the infrastructure provided by the organizers, but you can bet there will be people with smartphones at the event.

COLLECTING BIG DATA FROM SMART METERS ALL OVER THE WORLD

Suppose there is a meteostation that uses BT to send the forecast data over to a user's smartphone. You use that in rural areas, where the Internet connection is poor, just to know what to wear outside. However, you collect invaluable data. But when data from multiple meteostations is combined, it makes up for quite a precise weather forecast. One may look at the air pollution case in China[7]/. There are couple of meters in every district of the large cities, sometimes in rural areas as well.

The weather forecasting services market is projected to grow from $1.10bn in 2016 to $1.56bn by 2021, at a CAGR of 7.15% during the forecast period. The base year considered for the report is 2015, and the forecast period is from 2016 to 2021.

Big data processing owned by no single company is a new word for social benefits and a true fair competition.

LOGISTICS

Suppose an eBay seller wants to ship something to a person in the other end of the city. The seller sticks a beacon to the package and just gives it to any stranger passing by, who volunteers to drop the it at the destination. The package is automatically tracked and the buyer just need to casually meet the stranger to get their package. . Even if the "courier" leaves it somewhere midway, the package is still tracked by people nearby. Therefore, as a buyer, you will never have to waste time standing at one place waiting for a postman to arrive at your location. The buyer and the seller always know the exact location of the package.

It works across countries and continents. It works even in the areas where post service is not that as smooth as Amazon Prime.

The technology may be used by corporations to tracking at a warehouse, by ecology organisations to track waste dropped in a river, to track anything anywhere where people are. The beacon just locates itself and records the data. Once it finds a connection, it transmits the data. It's affordable and provided by Moeco.

TRAFFIC
METERS

Suppose you are the mayor of a city and would like to resolve whether it makes sense to put on traffic lights for the pedestrian cross. If the road is busy, then you should do it, otherwise not. So generally, you would send someone to the intersection to count the passing cars or place a mobile device to track the cars on the spot, but the device might be stolen, so it has to be guarded by someone anyway. And to provide a sufficient result, this activity should be carried out repeatedly for a period of time.

Instead of that, a smart beacon with the only functionality of detecting large metal objects passing by can be placed on the intersection. It transmits data via BT, and to steal it seems absolutely useless as it is part of a global network with a unique ID. The beacon can even operate in tunnels and small towns. Affordable and powered by Moeco.

Same benefits of big data are applied and best algorithms and software might be shared.

GO
TO MARKET

London

Hong-Kong
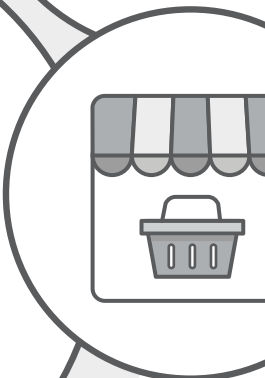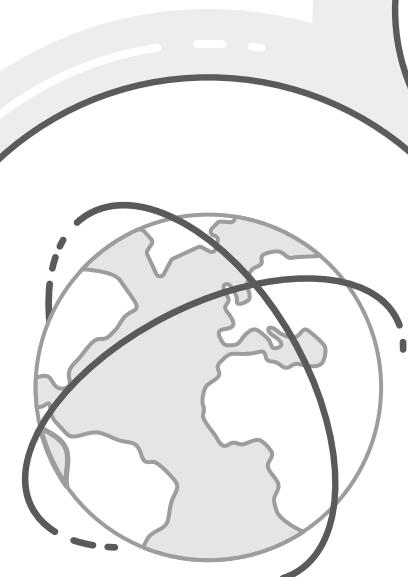
LONDON

The UK's IoT marketplace was worth £13.3bn in 2015, and is expected to rise to £20bn by 2018[1]. The launch of Things Connected in London was a big step in creating a national innovation support programme for LPWAN testbeds. The aim is to replicate this experience in a number of UK regions to support local IoT sector growth, and develop applications relevant for the local community.

Things Connected initially provides 50 LoRaWAN base stations located across London to establish the UK's largest IoT LoRaWAN network. Free to use, the programme will provide a testbed to support the evolving IoT-technologies in their roll out. LoRaWAN is the first phase of the testbed, and additional low-power wide area network (LPWAN) technologies will be included as the network develops.

To deliver Things Connected in the capital city, Digital Catapult works in collaboration with BT, Future Cities Catapult, Everynet, Beecham Research, AllThingsTalk, BRE, Imperial College London, King's College London, UCL and Queen Mary University of London.

HONG-KONG

More than 300 skyscrapers line the streets of Hong Kong, and many of them are lit, heated and cooled by a connected infrastructure that enables remote monitoring and management of in-building systems[8].

With LPWAN technologies in place, a wide array of IoT applications is set to explode. Freight monitoring, meter management and asset tracking are likely to be popular use cases in Hong Kong. The total IoT spend in Hong Kong to be$1.85bn by 2020. The top vertical industries are likely to be transportation, utilities and smart city solutions[1].

Finally, Hong Kong can increase its chance of being an Internet of Things world leader if activists here join in the worldwide "things network" movement that aims to create city-wide, free networks for the IoT data exchange, in essence turning an entire city into a laboratory for experimentation[9].

TEAM
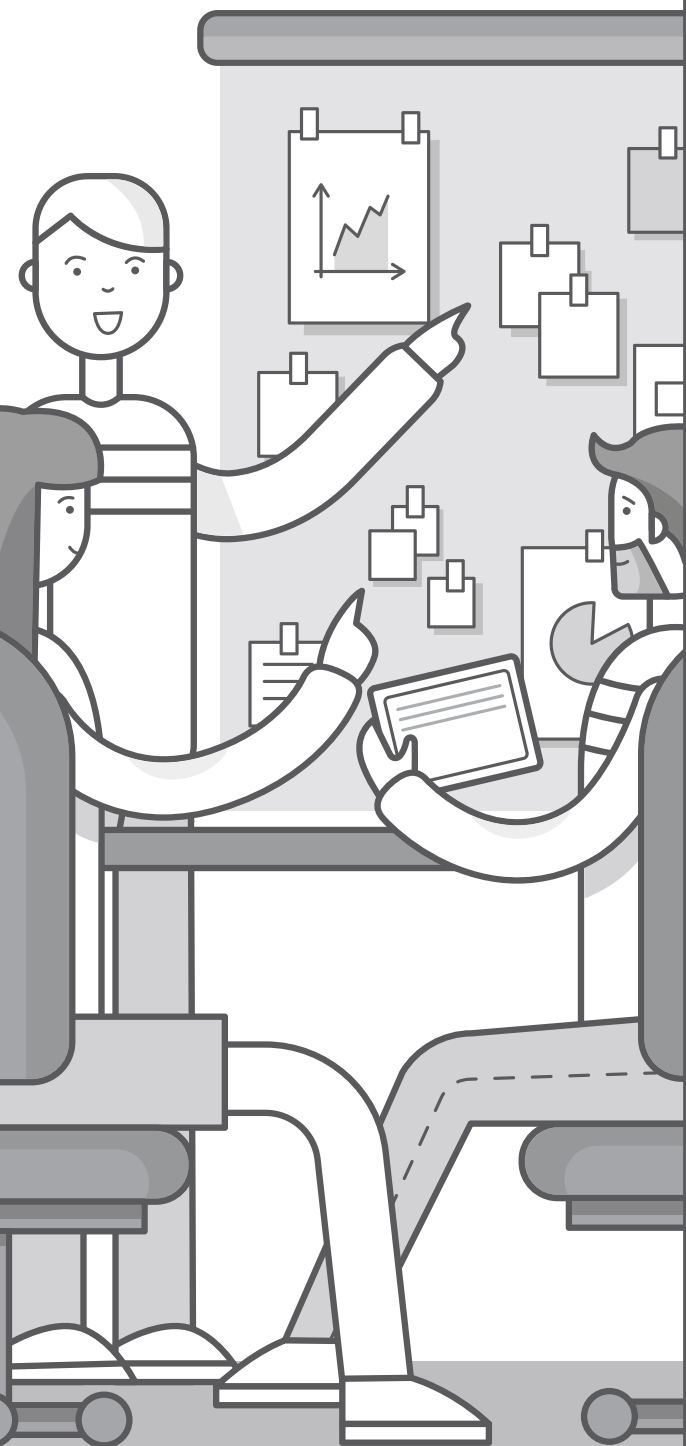
Mit Gorilovsky
Founder and CEO

Salome Parulava
Co-founder

Stephen Chase
Head of Marketing

Alex Vasilenko
Project Manager

Igor Vaag
Business development director

Alex Korolkov
CTO

David Vasquez
CCO

Alex Dolgushin
VP for Design

Vladimir Suvorov
Product manager
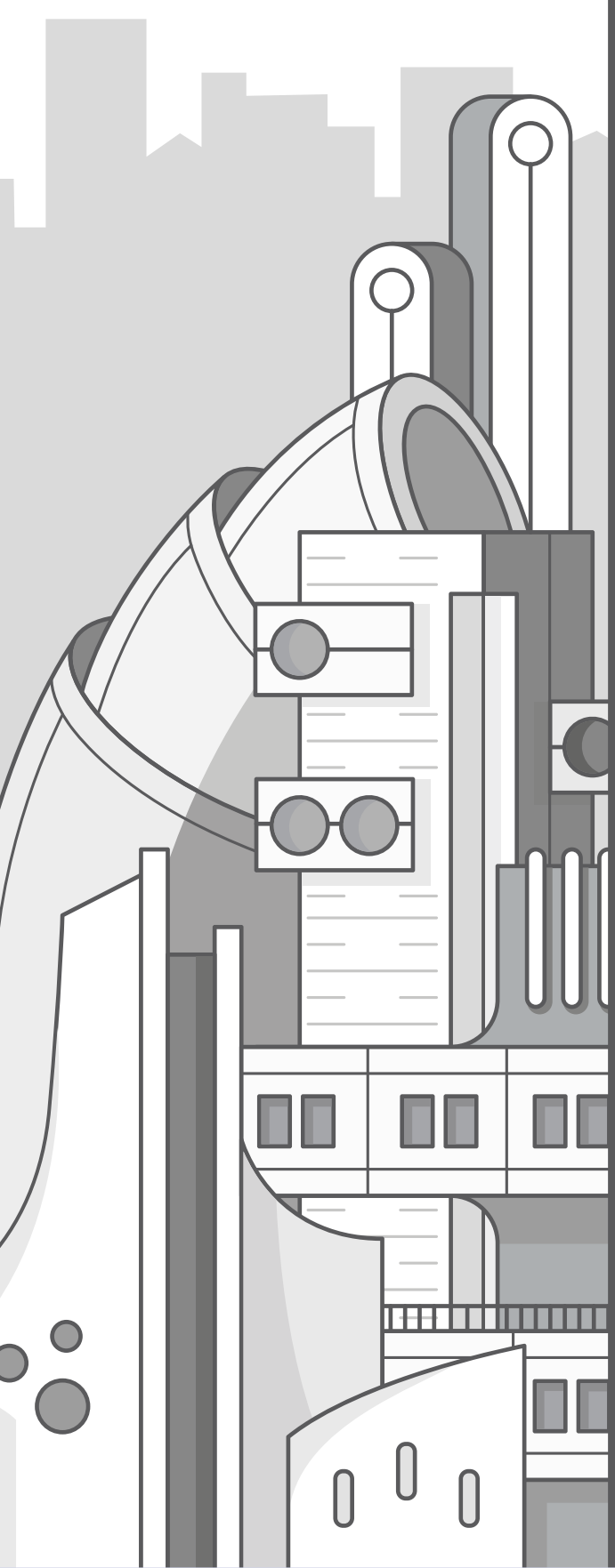
Kostya Turchannikov
Chief Business
Development Officer

Vasily Volontsevich
Chief Engineer

Kate Asinskaya
Account manager

ROAD MAP

Closed Alpha

Q3/Q4
2017

**Extended B2B
part & testing**

Q1
2018

B2B Pilots

Q2
2018

B2B beta

Q3
2018

B2B release

Q4
2018

Market release

Q1
2019

LINKS

1. http://www.marketsandmarkets.com/Market-Reports/machine-to-machine-market-732.html

2. https://newsroom.t-mobile.com/news-and-blogs/iot-access-packs.html

3. http://industryarc.com/Report/187/Bluetooth-smart-market-forcast.html

4. http://industryarc.com/PressRelease/43/bluetooth-smart-lowenergy.html

5. http://industryarc.com/PressRelease/43/bluetooth-smart-lowenergy.html

6. https://www.quora.com/How-much-does-LTE-4G-radio-base-station-cost

7. http://aqicn.org/city/beijing

8. http://cw.com.hk/feature/powering-iot-low-power-wan-hk

9. http://www.scmp.com/comment/insight-opinion/article/1898359/how-hong-kong-can-become-smart-city-connected-future

http://