

energitoken

energimine

# WHITE PAPER

---

Decentralizing global energy markets by rewarding energy efficient behaviour | *Power to the People.*

28<sup>th</sup> January 2018 | Version 4.0

---

*This White Paper states the current views of Energi Mine Limited concerning the Energi Mine Blockchain platform and related matters. Energi Mine Limited may from time to time revise this White Paper in any respect without notice. The information entered in this White Paper is indicative only and is not legally binding on Energi Mine Limited or any other party. This document is for informational purposes only and does not constitute and is not intended to be an offer to sell, a solicitation of an offer to buy, or a recommendation of: (i) Energi Token, (ii) an investment in the Energi Mine Blockchain Platform or any project or property of Energi Mine Limited or (iii) shares or other securities in Energi Mine Limited, or any affiliated or associated company in any jurisdiction. Please read the important legal disclaimers at the end of this White Paper.*

## CONTENTS

EXECUTIVE SUMMARY	3
ENVIRONMENTAL IMPACT	4
CURRENT ENERGY SAVING INITIATIVES	7
EMPOWERING COMMUNITIES	10
ENERGI MINE – EXISTING BUSINESS	11
THE CURRENT PROBLEM	12
SIZE OF THE MARKET	16
ENERGY MARKET REGULATION	18
TOKENISATION	19
EXAMPLES – TOKEN USER CASES	20
THE TEAM	22
FUNDING USAGE	26
TECHNICAL SPECIFICATIONS	27
TOKENOMICS	29
ARTIFICIAL INTELLIGENCE	30
ARCHITECTURE	31
PARTNERSHIPS	32
DEVELOPMENT	33
ROADMAP	34
MEDIA	35
LEGAL DISCLAIMERS	36

## 1. EXECUTIVE SUMMARY

Energi Mine aims to decentralize the \$2 trillion global electricity markets which are naturally closed and controlled by a handful of large players. Energy companies are currently incentivised to sell more energy and at the highest possible price.

The market for power (electricity) generation is naturally becoming decentralised, in that more and more individuals and businesses are generating their own energy through renewables. However, they are still selling this energy back to the big energy companies.

Energi Mine is creating a platform that matches customers with smaller generators, as well as creating a global eco-system whereby users are rewarded with tokens (Energi Tokens – ETK) for energy-efficient behaviour.

We believe that when it comes to energy, reward mechanisms must have a financial benefit to the user before behavioural change occurs. Therefore, we believe that the tokenisation of the market will be the only real driver to create a more energy-efficient system.

For example, if a commuter is encouraged to use public transport by the Local City Authority, they could be rewarded by being given ETK. ETK then has a cash value, but could also be used to pay directly for the commuter's domestic energy bill, or charge their EV.

Our goals are to reduce energy consumption globally, and create a token-based platform, which provides financial incentives to reward energy saving behaviour.

Energi Mine is an existing business, based in our own offices in Manchester, UK – run by an experienced team of both energy and tech professionals. The business currently focuses on the business sector, and manages over \$140m worth of energy on behalf of over 1,100 sites across Europe with existing revenue of \$500,000.

The team deploys Deep Learning/AI models to manage energy consumption on behalf of corporate clients, leading to more efficient service delivery in a very manual sector. Our CEO Omar Rahim comes from the energy trading sector, having previously managed over \$3bn worth of energy before founding and successfully exiting his commodity trading business.

Our CTO Alain Richardt is our lead Ethereum engineer and a cybersecurity expert who spent time at Google, before selling his Big Data business to a NASDAQ-listed tech company.

In this white paper we set out our plan to revolutionise the energy sector – changing the way energy is both traded and consumed. With power markets on all Continents deregulating to allow for greater competition, the time is right to launch Energi Token – the tokenized platform for energy.

## 2. ENVIRONMENTAL IMPACT

There is a direct correlation between an individual's energy usage and their impact on the environment. Essentially, when a person consumes less energy, they reduce the number of toxic fumes that need to be produced by power plants in the first place to create that energy. This then conserves the earth's natural resources and protects natural ecosystems from destruction. Each individual step a person takes to reduce their energy intake directly reduces their carbon footprint thus creating a more eco-friendly environment for us all.

Over recent years, creating awareness of this connection between a person's actions and their impact on the environment from an energy perspective, has been on top of the agenda of policy makers across the world. Governments, regulatory bodies, commercial institutions, and high-profile individuals have all been pushing this rhetoric and have collectively created solid appreciation of the cause. The impact of what we do in our daily lives such as how we commute to work, how we use appliances at home, how we recycle etc, have all been put in the spotlight and has made us more energy conscious.

The most noticeable way that reducing energy helps the environment is by decreasing power plant emissions. To generate electricity, most power plants burn coal, crude oil or other fossil fuels. This method of creating energy is relatively inexpensive, however carbon dioxide, sulphur dioxide and nitrogen oxides are just a few of the by-products that come from these traditional methods of power generation. Cutting back on energy consumption reduces the amount of electricity that power plants need to make, subsequently reducing the amount of fossil fuels that are burned each day.

Carbon dioxide, which accounts for most of all airborne pollution, is a greenhouse gas. When carbon dioxide is released into the air, it absorbs the sun's warmth and keeps heat in our atmosphere. This "greenhouse effect" is a natural phenomenon, and as power plants burn more fuel to create more energy, the extra carbon waste traps too much heat. This can have a detrimental impact on our land and our lives. Effects of greenhouse gas emissions include:

- ✓ Rising temperatures, heat waves and drought
- ✓ Higher sea levels
- ✓ Abnormal weather patterns
- ✓ Increased intensity of natural disasters

## CONSERVING NATURAL RESOURCES

When someone opts to cut back on energy use, they also help conserve limited natural resources that would otherwise be used to power the power plants. Less demand for energy creates less demand for harvesting fossil fuels. Turning off the lights at night for example saves coal, natural gas and more. From an economic standpoint, it's critical to conserve our finite resources.

## SAVING ECOSYSTEMS

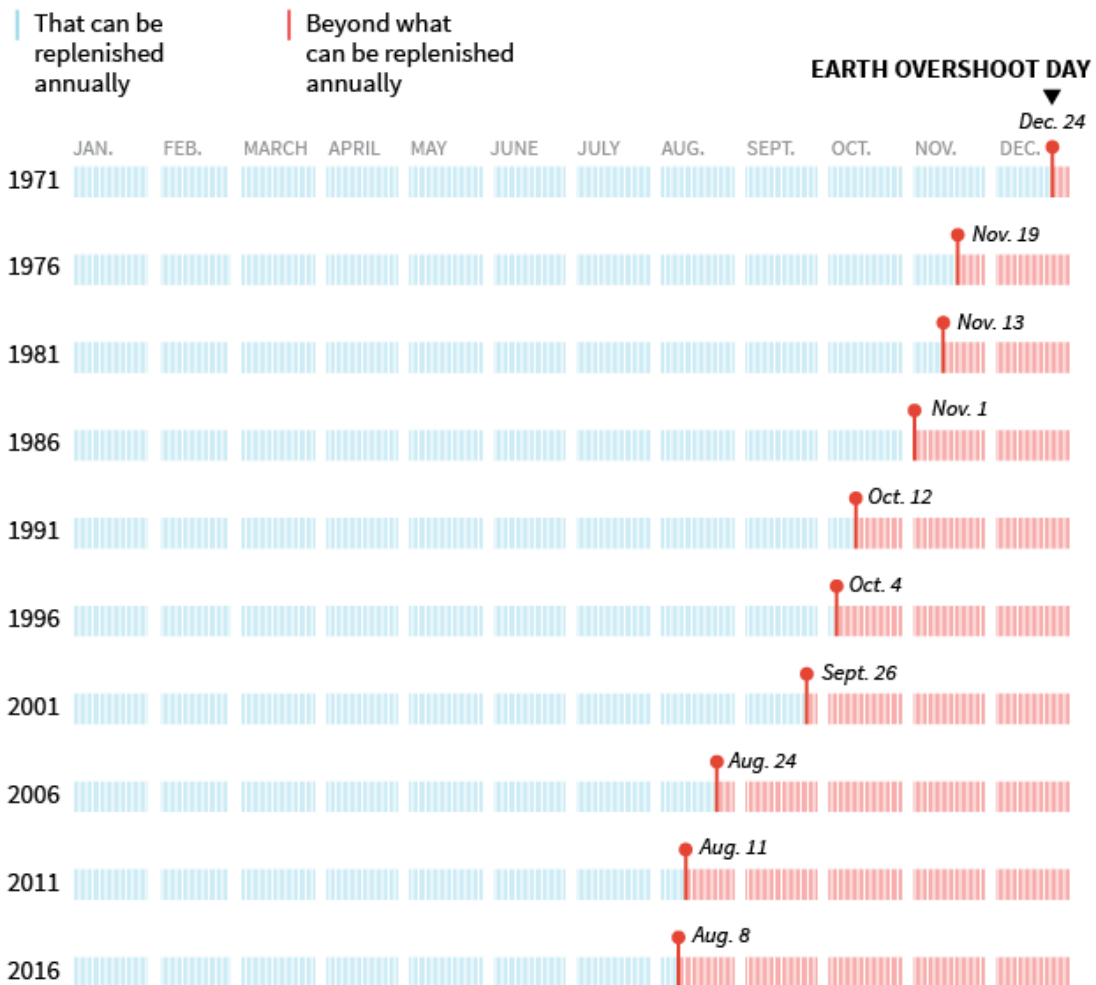
In addition to impacting climate patterns and depleting stores of natural resources, excessive energy use can harm animals and ecosystems. Mining, logging and material extraction associated with the provision of fossil fuels destroys habitats on land and in the ocean. Human- induced air pollution is one of the main reasons that biodiversity is disappearing at 1,000 times the normal extinction rate.

## OVERSHOOT DAY

### Living In The Red

Earth Overshoot Day, also known as Ecological Debt Day, is the day of the year when human demand for ecological resources exceeds what the planet can replenish annually. Since 1970, it's come earlier and earlier every year -- meaning humans are using up natural resources at a faster rate than we used to.

#### Days where humans are using resources...



Source: Global Footprint Network

The Huffington Post

### 3. CURRENT ENERGY SAVING INITIATIVES

Roughly speaking, there are two types of energy efficiency initiatives that can be implemented; working with existing tools, and investing in new equipment and technology. Various initiatives have been implemented across the world by policy-makers, but all have had limited success. More and more economists are finding that energy efficiency policies do not actually work that well. Costs to implement programs often exceed the benefits and the actual realization of any savings aren't always apparent or tangible enough.

#### REBATE PROGRAMS

To date, no energy efficiency program in the USA has achieved significant scale and realized dramatic reductions in total greenhouse gas emissions. Energy Efficiency rebate programs can help stimulate business but they are not leading to true market transformation.

##### Solar Power Subsidies

The UK government launched the Feed-in Tariff (FiT) in 2010, paying domestic users for the energy they produce through solar panels. The solar Feed-in Tariff rewards homeowners who install solar panels. The government pays for every kWh of energy a user's panels generate.

Users get paid for both the energy they use (the generation tariff) and the energy they do not use (the export tariff). Energy bills should drop significantly, because the panels will generate free electricity.

With the costs of solar panels plummeting, the government announced plans in 2015 to reduce the Feed-in Tariff by 87%. The number of solar panels being installed in the UK has fast been diminishing with many commentators suggesting that industry is being strangled by government policies despite being one of the cheapest sources of electricity.

Based on recently released government statistics, the number of people putting solar panels on their homes is now at a six-year low. Between January 2017 and March 2017, there were about 650 rooftop deployments a week – a fall of more than 75 per cent on the long-term average of 2,700 a week since 2010. In the same period 2017 has also seen a huge collapse in the number of solar panels being put up by businesses following the withdrawal of virtually all subsidies, a stunning business rate hike of up to 800 percent and the imposition of "red tape".

#### HARDWARE PURCHASES

According to market research, one-third of homeowners in the US who have paid for energy- efficiency upgrades, e.g. Switching to CFL, (compact fluorescent lamp) light bulbs, or installing Energy Star appliances say they have not seen the decrease in energy bills that

they expected. This is because once they have paid for energy-efficient initiatives they still act and behave as they did before, if not a little excessively. This is called an energy efficiency rebound. People think that because they have installed CFLs, they can leave the lights on all the time. These findings suggest that installing energy efficient products alone are not enough. It is how we change our behaviour alongside the installation of these initiatives that really make the difference.

## SMART METERS

A survey recently revealed that three quarters of the public support smart meters and the sharing of energy consumption data. Governments across the world hope to offer the technology to every home and business with varying timescales.

Smart meters are a valuable tool for helping people understand and quantify energy use by providing accurate energy use data in real-time. This can be shown on an in-home display and read remotely by the energy supplier. Historical information on energy use and cost will allow consumers to compare current and past use.

The aim is for smart meters to help make energy consumption more visible to consumers and help us understand how much we're actually using.

Research has shown that people use less energy if they are more engaged with how much they are using and how it is being used. An understanding of how much energy consumers use in monetary terms daily would encourage them to be more energy efficient.

Commentators state that although the uptake of smart meters has been high, the technology alone is not sufficient enough to change the way we consume energy - Smart meters will need to be accompanied by incentives and support systems to make us change our behaviour.

Smart meters need to fit into a larger pattern of environmental messages – energy use information on its own is not going to be enough. Because energy consumption is a deeply ingrained behaviour that ties into work, shopping and family life, it will take quite a lot of effort to change.

Studies show that successful energy saving programs foster a sense of achievement and identity. Suppliers are now looking at other ways to engage users with energy-saving technologies and schemes.

Energy companies are starting to take advantage of basic human behaviour to encourage people to reduce energy consumption. However, we feel that it's important that they embrace the current digital world we live in and find solutions that mould themselves around existing patterns of life – not create new ones. Behavioural change will eventually come over time, first by early adopters and then by the general public, once the actions that need to be taken to accomplish this do not require too much effort, upfront cost or huge change in human behaviour. Small, tangible steps in user behaviour can be used by making



the actions required by the end user as easy as possible. This also needs to be tied into clear monetary incentivization. Such incentives can clearly be communicated in this digital world through the use of social media platforms as well as other digital communication platforms.

#### 4. EMPOWERING COMMUNITIES

A clear indication of how societies have become more 'energy conscious' is the rise of 'community energy' projects and initiatives. The purpose of 'community energy' is to transition to a low carbon economy by creating a virtuous cycle of resource allocation for social and environmental benefit. It encourages large-scale community participation, ownership and responsibility.

Whilst action-oriented responses to climate change continue to grow exponentially, limited access to finance has hampered the development. Implementation of distributed energy solutions have not been established at anything like the scale or speed required to make a significant difference.

Initiatives such as 'The Community Energy Coalition' is a UK group of trusted and influential civic society organisations and sustainable energy experts, working to help enable communities take control of their energy. Their focus is on generating and saving energy together for the benefit of all. Their agenda is to ensure people themselves have a say and control how energy is generated, how much it costs and where it comes from.

It is clear that across the globe, communities are already coming together to change the way they think about the energy system and their relationship with it. This demonstrates how people have become energy conscious enough to feel motivated to make a change. However, progress itself has been limited due to the lack of the right mechanism.

Initiatives are overly reliant on investment in costly infrastructure, as well as an over dependence on governments and relevant institutions. Energi Mine believes that although the concept of 'community energy' is the right way forward (in that it is trying to empower individuals to take control of their own energy), it has failed due the lack of access to tangible actions an end user can actually make. It requires adoption of additional infrastructure and can only move forward at the speed of associated affiliations. Our model can achieve community energy by utilising existing infrastructure which has a low barrier to entry. These enablers will allow individuals to truly be empowered.

## 5. ENERGI MINE – EXISTING BUSINESS

Energi Mine was founded in 2016 by Omar Rahim. Our team are based in our own 3,500 sq.ft. offices in Manchester, UK. The company serves Industrial and Commercial (I&C) users of energy by carrying out energy trading and energy management services. Energi Mine sits in between a supplier of energy (large utilities) and a large consumer of energy. We use Deep Learning/AI models in our core offering, and are building blockchain solutions to complement our suite of products.

The company is a fully functioning commercial entity with operations, sales, finance and administrative functions. The company currently manages over \$140m worth of energy on behalf of its customers. It looks after approximately 1,100 customer sites across Europe (UK, France, Belgium, Netherlands).

The company has already booked around \$500,000 revenue in 2017. Our customers include one of the largest law firms in the world, one of Europe's largest fuel retailers and the UK's largest independent construction materials group.

Energi Mine owns all of its own IP, and has a suite of Deep Learning/AI models that are operational in relation to our clients' energy data.

The company adds value to its clients by advising on risk management strategies in the procurement of energy as well as using predictive modelling to give clients a unique insight in to their energy consumption. Energi Mine receives management fees for the above services.

We intend to capitalise on our market position and expertise by building the blockchain solutions outlined in this white paper and deliver them to power markets across the world.

## 6. THE CURRENT PROBLEM

*“Consumers are showing a greater desire to have control over how their energy is generated and distributed. Many domestic consumers are now both producers and consumers of electricity, for instance through rooftop solar panels or wind turbines. They are motivated by financial and environmental concerns, as well as low levels of trust in large energy suppliers...We could see more consumers move away from the traditional utility model and adopt community schemes or peer-to-peer trading arrangements to provide their energy needs instead”*

OFGEM, UK Energy Regulator

The existing model in the energy marketplace has four main issues;

### 1. Centralised

A small number of large energy companies supply millions of customers who are price takers.

### 2. Opaque

Markets are illiquid and in the hands of financial brokers. Electricity is traded OTC (over-the-counter) between energy companies or banks and therefore there is no transparency to users of energy.

### 3. Lack of incentives to use less energy

Energy companies make money from selling more energy, so consumers are not incentivised to change behaviour.

### 4. Lack of competition

Barriers to entry are high, with complexity of regulation and costs of entry being the two main reasons for the monopolies operating in all major power markets globally.

## OUR SOLUTION

The small number of blockchain energy schemes to date have focused on incentivising renewable energy generation. Whilst we feel this is a good application for blockchain, the model does not really resolve the key inefficiencies in the market. Our focus at Energi Mine is to reduce global energy consumption by incentivising through the token model. We feel our model will lead to:

1. A reduction in global energy consumption
2. A reduction in retail energy prices
3. The creation of an eco-system, including a transparent peer-to-peer platform to trade energy

Energi Mine is building an energy eco-system, a new energy market using blockchain at its core. The platform we are building will have two aspects; a peer-to-peer marketplace to buy and sell energy and a reward platform.

The peer-to-peer marketplace will connect generators and consumers on a common platform, bringing transparency to a notoriously opaque market. Members will be able to benefit from this disintermediation by connecting directly with each other, without an energy company/broker in between.

The platform will ensure prices are always truly market reflective, as opposed to being kept artificially high by the current monopolies we see all over the world.

Furthermore, a reward mechanism will be created that rewards energy-saving behaviour with Energi Tokens (ETK). Actions such as buying energy-efficient appliances, taking public transport and using less energy at home will be rewarded with ETK. The tokens will have a market value and can therefore ultimately be exchanged for fiat currencies or held to pay for future energy bills/Electric Vehicle charging.

The model is one that works in a global context and will be implemented across all power markets, which are becoming increasingly deregulated. The Chinese power market, which has always been closed, is also opening up in 2018, which will lead to access to a \$500 billion market.

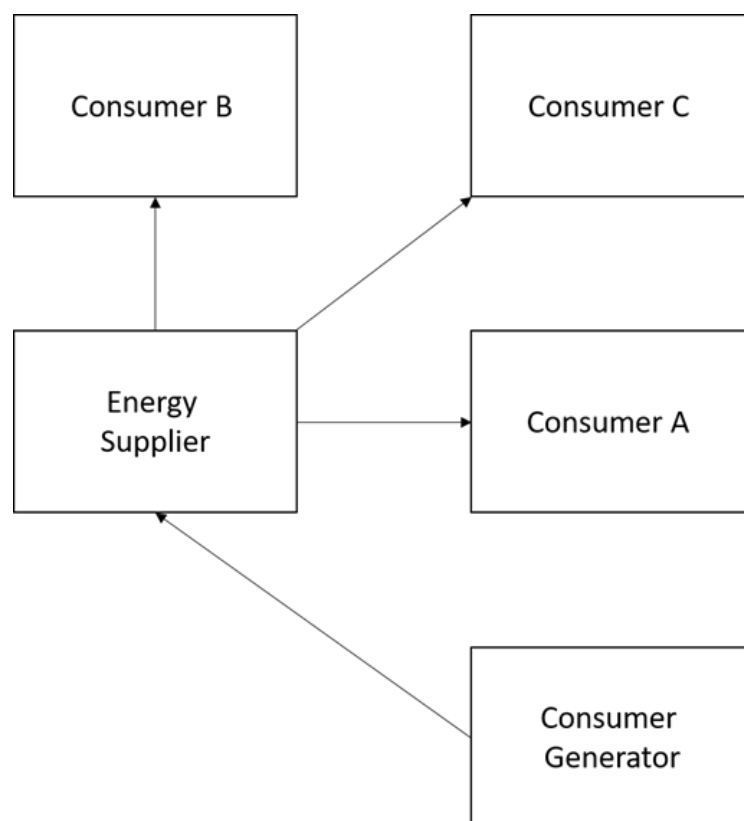
## HOW ELECTRICITY IS TRADED NOW

Electricity prices are currently traded via exchanges or OTC (over the counter). In many markets, over 75% of volumes are traded OTC. This means that bids/offers are left with financial brokers, and this is often done outside of exchanges. Visibility and transparency is one of the major features lacking in the current market. We currently have a centralised model, where a small number of large energy companies dominate the landscape. This is a model that has led to a lack of innovation as there has been no threat to the status quo.

A global move in to renewable technology has led to an increasingly decentralised market, where consumers are starting to generate their own electricity. In addition to this, as battery technology evolves, consumers are becoming more and more independent. There is however, a huge gap in this model. Consumers still have to use traditional utilities to both buy and sell excess energy requirements from their own generation.

## CURRENT SYSTEM

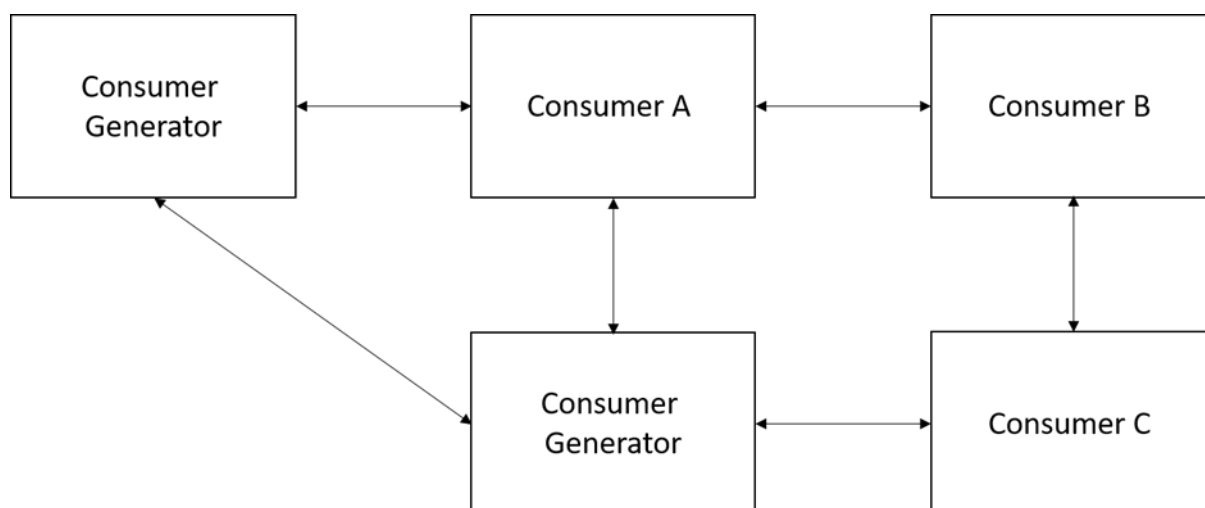
Consumer Generator produces more energy with solar than they need, so they have to sell some back to an Energy Supplier. This supplier will then sell that energy back to Consumers A, B and C with a margin added.



## NEW SYSTEM

Under our peer-to-peer model:

Consumer Generators could sell to different consumers (e.g. Consumer A, Consumer B or Consumer C) with each individual party better off financially from the transaction.



Any participant can buy or sell from any other participant.

Some consumers are also generators (e.g. wind/solar). All parties in our eco system are able to trade with each other. Large power stations (gas, coal, nuclear) are being replaced with thousands of consumer-generators.

Under our model, energy companies themselves will not necessarily be displaced, however their business models will be forced to adapt to the new economy. Energy companies will start to take payment of energy bills in tokens as there will be a market for those tokens and a value associated with them. Blockchain is appealing to energy companies as it will allow the energy companies to deal with the administrative burden of connecting to market operators, distribution and transmission network operators and other bodies through the blockchain. It would also allow consumers to pay daily or weekly for their energy automatically, with lower levels of debt.

Finally, it will give rise to greater competition in the electricity market. For instance, with our model, consumers will be able to “auto-switch” their energy supplier every 30 days. The system will tender their contracts every 30 days in a frictionless manner for the consumer. This will ensure a more competitive marketplace and truly market reflective prices.

## 7. SIZE OF THE MARKET

Total global electricity consumption was 21,190 TWh (Terawatt hours) in 2016, with 43% coming from Asia and 27% coming from the Americas. China and India made up most of Asia's consumption, at 58% and 12% respectively. This means that China alone consumed approximately 25% of global electricity in 2016.

Power traded globally is a market worth around \$2 trillion per annum, with various countries/territories at various stages of deregulation. Most major markets are either deregulated or in the process of deregulating, with the notable exception of the Middle East and Africa. However, those two regions make up less than 8% of global electricity used. Most noteworthy, the fact that China recently announced it would be starting the process of deregulation of its \$500bn electricity market in 2018.

Energi Mine has two core platforms that will integrate with Energi Token. The peer-to-peer trading platform and the reward platform. The peer-to-peer model will allow direct trading of electricity between users, without an intermediary; whereas the reward platform will award tokens for energy saving behaviour.



Figure 1. Regional breakdown of global electricity consumption.

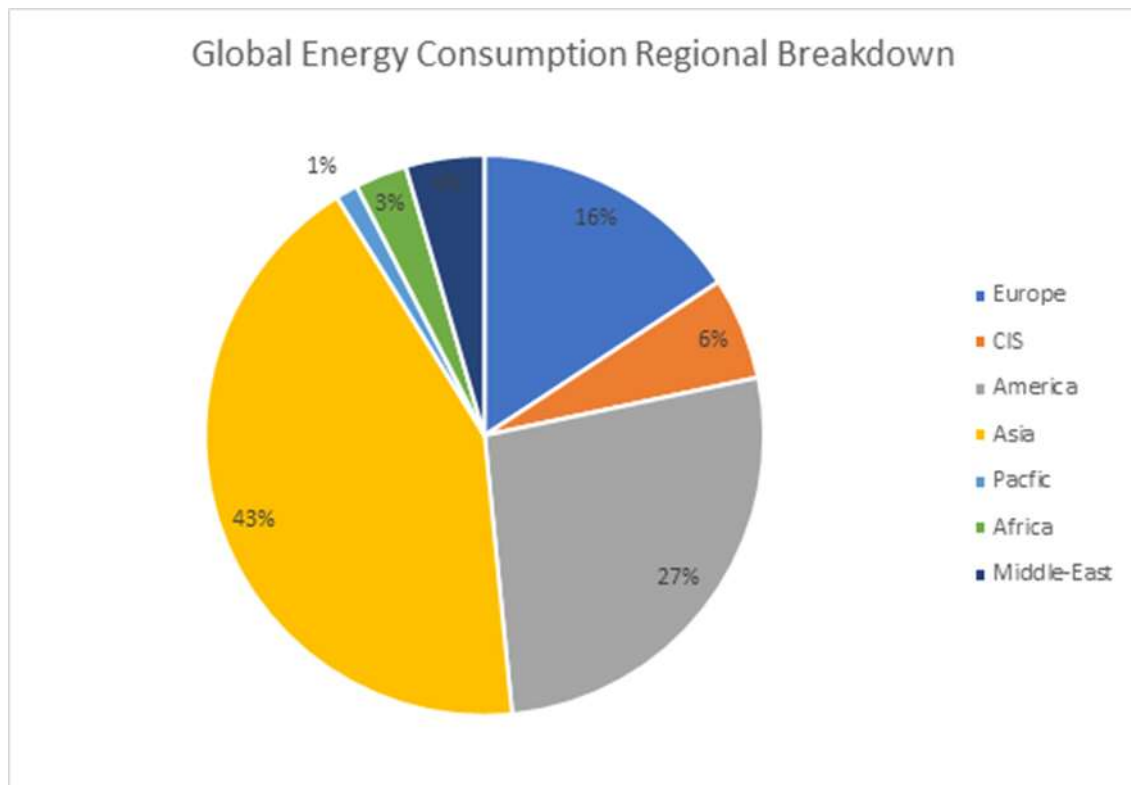


Figure 2. Detailed regional breakdown of global electricity consumption in TWh per year.

World Electricity Consumption: 21,190													
Europe	3,342	CIS	1,252	America	5,666	Asia	9,053	Pacific	274	Africa	638	Middle-East	965
Belgium	83	Kazakhstan	76	Canada	498	China	5,219	Australia	229	Algeria	60	Iran	250
Czech Rep.	61	Russia	887	United States	3,867	India	1,065	New Zealand	39	Egypt	152	Kuwait	53
France	448	Ukraine	128	Argentina	131	Indonesia	216			Nigeria	24	Saudi Arabia	296
Germany	533	Uzbekistan	49	Brazil	509	Japan	927			South Africa	205	UAE	114
Italy	293			Chile	70	Malaysia	149						
Netherlands	107			Colombia	52	South Korea	512						
Poland	141			Mexico	268	Taiwan	241						
Portugal	47			Venezuela	83	Thailand	183						
Romania	51			Argentina	131								
Spain	240												
Sweden	131												
United Kingdom	307												
Norway	121												
Turkey	229												

## 8. ENERGY MARKET REGULATION

There are around 50 countries globally that have deregulated or are in the process of deregulating their electricity markets. Deregulation generally refers to the shift to a competitive market, with private companies able to supply electricity as opposed to state-governed tariffs.

The European union has been trying to create a large, unified energy market across the continent. The end goal of these projects is to create an integrated energy system across Europe to allow its residents to benefit from reduced prices. It also allows a more sustainable and manageable energy grid. Levels of deregulation vary across Europe, with Western and Northern European markets being highly deregulated, as opposed to Southern and Eastern markets which can be described in general terms as partially deregulated.

In North America, most states in Canada have deregulated energy markets, the most complete being Alberta and Ontario. United States on the other hand has a wide spectrum of deregulation dependent on individual State.

Australia and New Zealand also enjoy a high level of deregulation in their respective electricity markets.

China and India account for around 30% of global electricity demand combined, and both countries have made recent progress towards deregulation. China has announced it will be partially deregulating its \$500 billion electricity market - a process that will commence in 2018.

Despite efforts to deregulate, most markets still see a lack of effective competition with individual markets dominated by a small number of large players. This, in its essence, is anti-competitive and regulators are alive to the fact that the progress has been insufficient. Regulators are publicly encouraging the opening of markets, and are aware of the potential disruption that new models can cause. Overall, this is seen as a good thing as it ultimately leads to a more competitive and transparent market for consumers.

It is Energi Mine's intention to work very closely with energy regulators across the globe, in order to reduce any regulatory risk in individual markets. Some territories require licensing to operate, however this is usually only if the entity is considered an energy supplier. Our team at Energi Mine has direct experience of the regulatory processes involved in becoming licensed in multiple territories.

## 9. TOKENISATION

The world spent over \$2 trillion on electricity last year (2016) and our token model will incentivise energy reduction and provide a marketplace for trading energy.

The tokens will be based on the Ethereum ERC-20 standard and can be bought on coin exchanges for a number of purposes, examples of which include the running of individual incentive schemes or to use as future settlement against your energy bill.

Tokens can also be earned by energy saving behaviour, such as commuting via public transport, buying an Electric Vehicle or consuming less energy at home or in the workplace.

For example, a consumer uses 50,000 kWh per annum (taken from their smart meter readings), the next year the consumer uses only 40,000 kWh per annum due to energy efficiency measures. The consumer will be awarded a number of Energi Tokens (ETK) which can then be sold and ultimately rewarded in fiat currencies. Alternatively, the tokens can be saved for future energy bills.

Tokens can also be saved up by an employer and distributed as a company benefit to reward company-wide energy saving behaviour.

Large institutions will also purchase quantities of ETK to run their own incentive schemes. The way we build our platform will be designed to encourage a collection of initiatives with a common goal. For example, a manufacturer of energy-efficient electrical appliances would buy ETK to give away to customers buying their product or a transport authority would purchase ETK to give to commuters taking public transport in to work.

The tokens will have an inherent value, with multiple user cases on a single eco-system.

## 10. EXAMPLES – TOKEN USER CASES

### A) Using ETK to settle energy bills

Customer has collected ETK from various energy saving activities outlined below. The Customer then uses the ETK to settle their regular energy bill with their supplier.

### B) Using ETK to access a peer-to-peer energy trading platform

Customer A has excess energy generated from their solar installation. Instead of selling to an energy company, they sell it directly to Customer B, who does not have any generating capability. Customers A & B both need ETK to access the exchange.

### C) Getting rewarded with ETK for reducing energy consumption

Company A saves 100,000 kWh on their energy consumption compared to last year. Company A is awarded with 1000 ETK which they can sell on exchange, pay their energy bills with or give them to employees as a staff incentive.

### D) Getting rewarded with ETK for using public, low carbon transport

Customer A currently drives to work. However, the Local City Authority runs an incentive scheme to encourage public transport usage and buy 100,000 ETK to distribute to its residents taking public transport. For every mile travelled on public transport, the Local City Authority gives ETK to Customer A.

### E) Using ETK with EV (electric vehicle) charging stations

Customer A buys ETK to “top up” their ETK account. They can then use these credits to access any EV charging point in the country to charge their EV. ETK is a common currency for all EV charging points.

### F) Manufacturers of energy-saving products (including IoT devices)

Manufacturers would purchase a quantity of ETK to “give away” with their energy-efficient electrical appliances. Customers now have an incentive to purchase energy efficient products as the ETK acts as a discount.

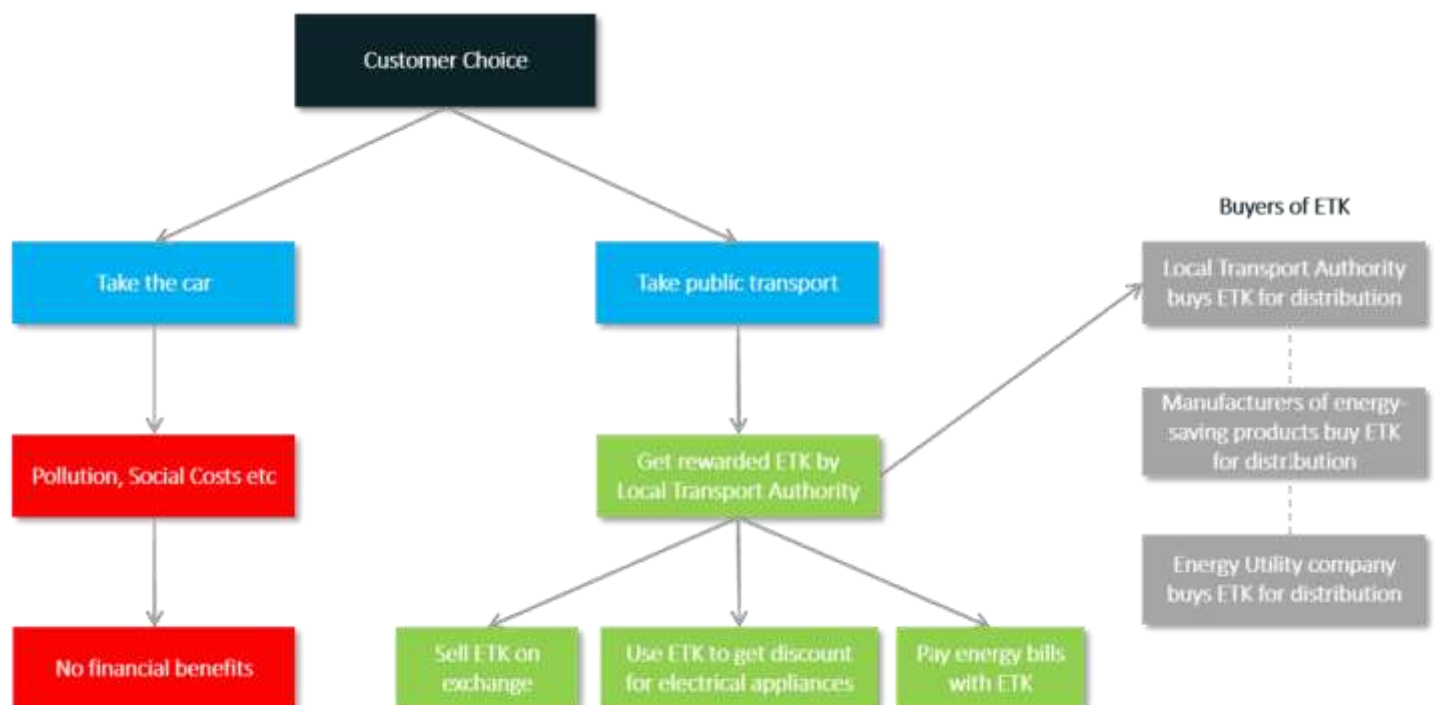
### G) Energy Utility company buying ETK

Utilities are keen to increase customer engagement and stickiness. Utilities may be large buyers of ETK to give them to their customers as a “reward/loyalty scheme”. These ETK can then be redeemed for cash or used to pay future energy bills.

### H) Battery trading exchange (Energy Storage)

Energi Token (ETK) will also be used within the energy storage sector. Battery technology is enabling electricity to be stored, for the first time on any real scale. Costs have been falling, which will mean an increase in the uptake in storage devices in both homes and businesses. Battery storage devices in aggregate effectively act as a dynamic balancing mechanism, where units can be turned up and down to balance the grid in localised areas.

Energi Tokens will be used as a currency to access our battery-trading platform. We are working in collaboration with the Energy Managers Association in this regard, with their project with the market operator – Elexon in the UK. This will see the formation of a new market which will allow batteries to be used as P&L centres to participate in secondary markets. Energi Mine will be building this platform, with ETK used to access the platform.



## 11. THE TEAM

### Omar Rahim, CEO

Omar has spent the last 12 years in the energy trading space throughout Europe for some of the largest energy companies in the world including Engie and Vattenfall. Having traded energy in both European and US markets, he then went on to found two companies in the energy trading space; successfully exiting them before co-founding Energi Mine in the UK. Having managed an energy trading portfolio of more than €3 billion, he co-founded Energi Mine after finding the energy markets were riddled with inefficiencies. Omar is a regular commentator in the media on topics surrounding the energy markets.

### Alain Richardt, CTO

Energi Mine's CTO Alain is our lead Ethereum engineer and an experienced programmer & cybersecurity expert specialising in Blockchain and Deep Learning/AI. Having worked for a succession of billion-dollar companies, he is the overall technical lead on the project. Alain previously founded, then sold his Big Data start-up to a NASDAQ-listed company in 2016. He has previously played a key role in helping international corporations fend off cybersecurity threats. He also worked for Google, before joining Energi Mine. He was named as a "Top 3 achiever in tech" in New Zealand by PWC before moving to London in 2010.

### Phillip Eggert, Senior Engineer

A blockchain enthusiast, Dr. Philipp Eggert holds a PhD in Theoretical Physics, with a Masters in Mathematical Finance from the University of Oxford. He has 11 years' experience in financial and energy markets spent at leading energy companies such as Vattenfall and Gazprom. Dr. Eggert's main interests are in programming and modelling quantitative strategies across the spectrum of energy commodities.

### Ralf Meyer, Senior Engineer

Ralf holds a Masters in High Energy Elementary Particle Physics, having earlier studied as an electrical engineer in Germany. As part of his masters, he wrote his thesis based on one of the experiments that announced the discovery of Higgs boson. A programmer with advanced Java, C++ , Python and Solidity Ralf has a good knowledge of applied Machine Learning concepts to develop energy products, having worked in the industry for 7 years.

#### John Townsend, CFO

John brings 30 years of financial experience to the team at Energi Mine. With a background in Corporate Strategy gained from large “Big 4” firms such as Deloitte, he is responsible for the financial planning of the company. A Chartered Accountant by trade, John has managed the financial affairs of companies and HNWLs across the globe.

#### Sid Sadique, Adviser

Sid has spent over 30 years in the transport and fleet management industry, founding one of the leading independent players in this space, with his company currently turning over in excess of £100m. An electrical engineer by trade, Sid is heavily invested in the EV (electric vehicle) and Autonomous Vehicle space. He brings a wealth of knowledge of the transport sector and how Blockchain can be applied to the battery and EV eco system.

#### Rebecca Grisewood, Legal Counsel

Rebecca heads up the legal function at Energi Mine, drawing on over 30 years’ experience in the sector. Her experience has been built up in the corporate sector of the field, specialising in mergers & acquisitions as well as structuring deals. She is a partner at one of the largest corporate law firms in the UK.

#### Eddy Travia, Advisor

Eddy Travia is a pioneer investor in blockchain technology start-ups and the CEO of Coinsilium, a London-based venture builder, accelerator and investor in early-stage blockchain technology companies. Coinsilium shares are traded on NEX Exchange in London (NEX:COIN). He was named among the ‘Top three Most Influential Investors’ at the Blockchain Awards. He also regularly delivers keynote speeches on blockchain and advises corporates and financial regulators.

#### Yacine Terai, Advisor

Founder of StartupToken, a global accelerator and consultancy for StartupToken Generating Event. CEO of Tokens Capital, a crowd sales and Blockchain investment firm as well as Blockchain VC for Consilium, the first ICAP ISDX Blockchain investment company to be publicly listed.

Speaker, professor, angel investor and educator on Blockchain & crypto investment space with 15+ years in the global technology startup space.

#### Lord Redesdale, Advisor

Lord Rupert Redesdale has an extensive history in the energy sector having been the Liberal Democrat spokesman for Energy in the House of Lords. He has been a member of the House of Lords since 1991 and has worked on a large number of energy related pieces of legislation and has tabled more Private Members Bills on energy regulation than any other Peer. In 2012 he formed the Energy Managers Association of which he is CEO. The EMA has been recognized by Government as the professional body for Energy Managers. The membership which now has over 1500 members who manage over £6 billion of energy spend is involved in all areas of energy efficiency, and storage. Redesdale in 2012 was awarded the accolade of Environmental Parliamentarian of the year by the Chartered Institution of Water and Environmental Management and is the CEO of a water retailer, The Water Retail Company.

#### Michael Terpin, Advisor

Michael Terpin is founder and CEO of Transform Group, Coinovate, a cryptocurrency consulting and development company; CoinAgenda, an event series for cryptocurrency investors, and SocialRadius, one of the nation's first social media marketing firms twice named to the Inc. 5000. Terpin also co-founded BitAngels, the world's first angel network for digital currency startups, and he is managing partner of bCommerce Labs, the first blockchain incubator fund, and a partner in Flight.

#### Dr. Moe Levin, Advisor

Dr. Moe Levin is the Chief Executive Officer (CEO) of Keynote, an investor in high-tech startups, and an advisor to governments, regulators, banks, and venture-backed companies. He has been involved with The Global Blockchain Council in Dubai (2015 - present) , the harmonized VAT treatment of Bitcoin (2013), The OECD Working Party 9 (2013-2014) amongst others. He also Co-Founded the first accredited Blockchain Academy, was an early investor in RSK Labs, Labfresh, Dropbox, and others. Prior to founding Keynote, Moe was responsible for launching a venture-backed startup in Europe which raised \$30m from Richard Branson, Index Ventures and others.

#### Keith Teare, Advisor

Keith lives in Palo Alto California and is a founder and Executive Chairman at Accelerated Digital Ventures - a leading Venture Company based in the UK. He is a co-founder of TechCrunch and Archimedes Labs. Previously he founded the world's first Internet cafe - CYBERIA, and Europe's first Internet Service Provider for Consumers – EasyNet.



Tony Xhufi, Advisor

Entrepreneur with extensive experience within fintech, alternative finance and other markets. He has gained valuable experience within Big 4 consultancy and at present he enjoys advising startups.

Ernst and Young, Professional Advisors

Ernst and Young are providing professional advice to Energi Mine.



## 12. FUNDING USAGE

Funds received from the token sale are intended to be used mostly for the development of our plan outlined in this document. Approximately 62% of the funds will likely be used in the development of the platforms, with 24% going towards sales and marketing activities. The remainder will be used for operational and legal costs. Wherever possible, partners and developers will be paid in ETH.

### Development:

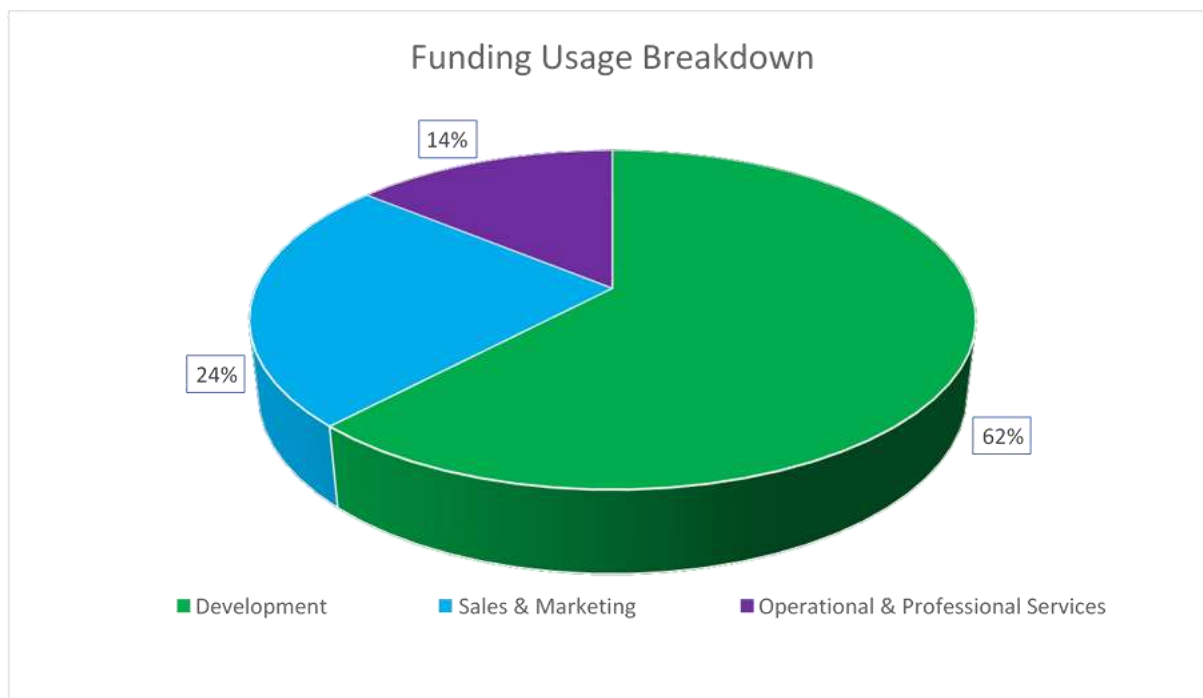
The architecture and build of the peer-to-peer platform, along with the reward platform. This will also include integration with energy supplier systems and our AI modules.

### Sales and Marketing:

This will include attracting customers to the platform as well as forming strategic partnerships with other companies. Funds here will also be used to promote the platform at industry events.

### Operational & Professional:

Costs covered here will include day-to-day costs of running the business, for example support services and administrative costs. Part of the fund usage will be used in the acquisition of licenses to operate (where necessary in some jurisdictions) and other legal costs which may arise.



*All costs are estimated, and subject to change without notice*

### 13. TECHNICAL SPECIFICATIONS

#### Trading Platform

- Easily allow community members to trade Energi Tokens with each other
- Automatic generation of Smart Contracts so that customers can submit their contracts for tender
- Suggestions to consumers for changes in consumption patterns from AI Platform (below)
- REST API to enable third party interaction
- Incentive multipliers for rewarding non-carbon / carbon friendly energy sources
- Energi Mine Administration
  - Administration of token
  - Smart contract management

#### Core Features:

Incentives for carbon friendly consumption can be distributed by automation, incentivising platform use by regulatory authorities, suppliers and consumers. Distribution by Smart Contract allows global scalability.

Giving the consumers the option of submitting a tender means that energy companies can directly compete without the need for intermediate energy brokers. The addition of thresholding will mean that the consumer can set a minimum standard for their contracts, optionally including non-carbon components.

#### Integration Platform:

- Smart Meter integration at the individual meter level
- Automatic data ingestion, deduplication and storage of time series data
- SDK Creation for Third party platforms with an emphasis on simple integration and lots of code examples
- Generalized API for IoT devices

#### Differentiators:

- Simple integration is key to mass adoption. Providing code examples and rapid technical support ensures integrator success by lowering friction
- Consolidation of metering data allow for broader analysis by the AI platform
- Real world implementations of remote sensors often involve sporadic network connectivity

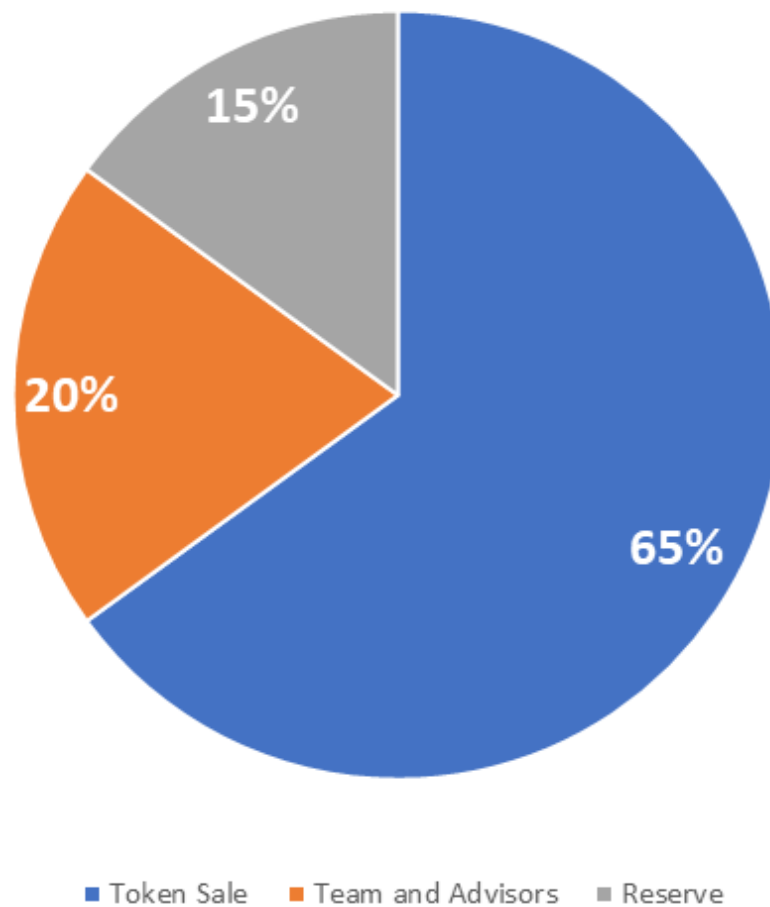
#### 14. TOKENOMICS

Token: Energi Token (ETK)

Token price: 1 Ethereum (ETH) = 30,000 Energi Token (ETK)

Token total supply: 2,307,692,310

The number of tokens will be split as below:



A reserve will be kept which will give Energi Mine the option to allow corporate partners (e.g. transport authorities, manufacturers, electric vehicle industry) to purchase tokens in order to put them in to circulation for their reward schemes.

Any unsold tokens will be destroyed with the supply staying broadly within the proportions in the pie chart above.

## 15. ARTIFICIAL INTELLIGENCE

The rapid increase of energy suppliers, energy consumers, intermittent renewable energy sources, smart meters and IoT will mean an exponential amount of energy usage data will be produced.

The only practical step to analysing and optimizing this high volume dynamic environment is to use automation and machine learning. The correct choice of ML technology is Deep Learning, due to:

- Robustness to noise
- Capability of modelling complex relationships
- Higher performance on large volumes of data
- Ability to exploit spatial and temporal hierarchies inherent in the data

### Artificial Intelligence Platform Core Components:

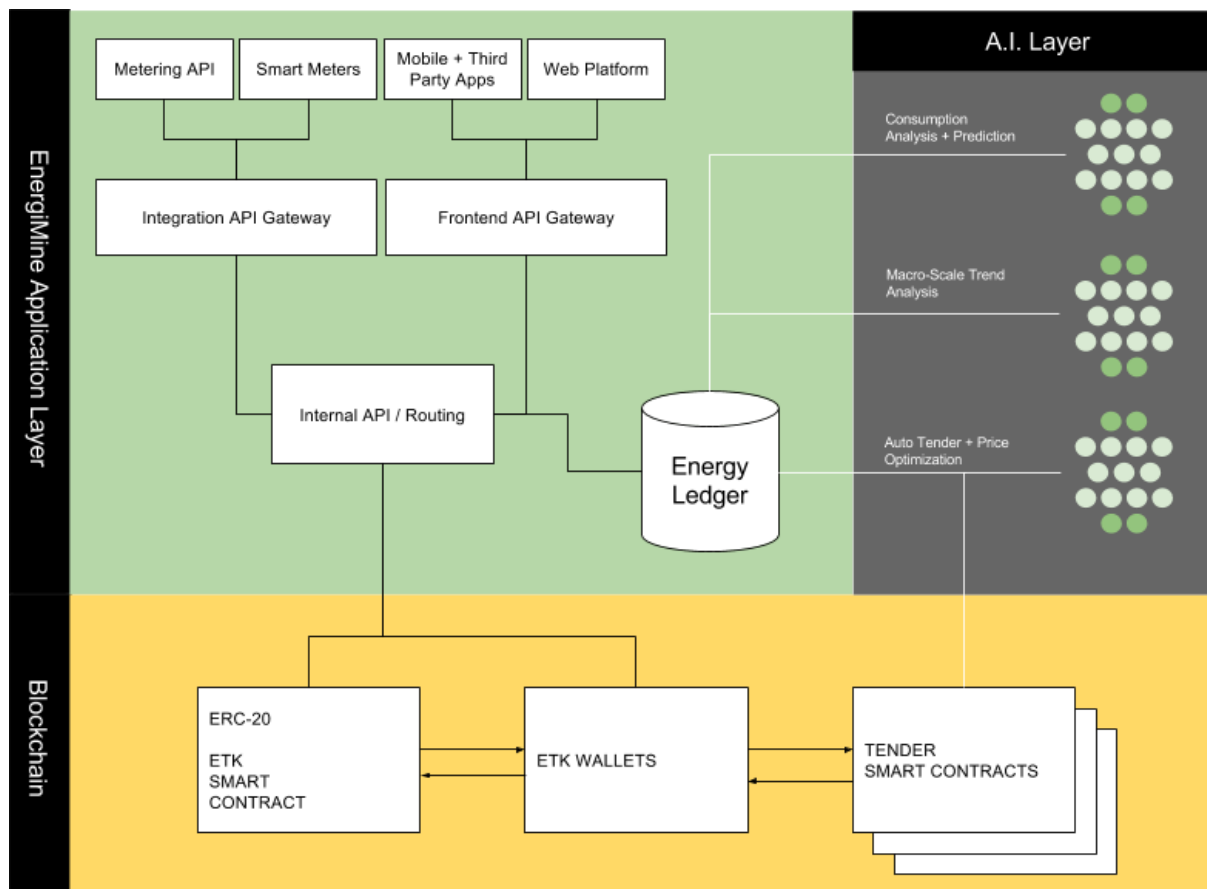
- Analysis and predictions of anomalies for individual meters
- Broader trend analysis of aggregated consumption data
- Simulation of Energy Consumption scenarios to predict outcomes when variables change
- Using the above for the optimization of Energy consumption for our strategic goal of decreasing global energy use

### Differentiators:

- a) Deep Learning will allow for more accurate time series prediction on noisy individual meters
- b) Programmatic generation of Deep Nets will allow for large horizontal scalability and global deployment
- c) Taking advantage of data locality means Deep Nets can be trained to spot broader energy trends across large numbers of meters. This has not been possible before due to data silo-ing and non-standard interfaces
- d) Data aggregation/locality will allow for Open Source Intelligence, i.e. integrating large open source datasets such as weather
- e) Using Deep Networks to simulate changes in variables (i.e. GAN Models) to simulate different Energy Consumption

## 16. ARCHITECTURE

### Platform Overview



The Energi Mine platform is designed for rapid horizontal scalability. Open protocols at module boundaries allow for third party smart contract participation, while blockchain consensus guarantees trust. Continuous Artificial Intelligence optimization allows for unprecedented and novel energy saving strategies.

## 17. PARTNERSHIPS

Organisation	Industry	Project
Confidential	Electric Trucks	Providing first crypto-based payment mechanism for charging EVs
Euro Garages	Service Stations	Corporate ETK reward scheme for staff
Energy Managers Association	Energy	Running trials on P2P trading and energy storage projects
Network Rail (via EMA)	Transport	Battery to battery trading platform trial



## 18. DEVELOPMENT

Post-token sale, the development will focus on three core areas. The main focus will be development of the reward platform. This will allow use of the platform to both distribute reward tokens and integration with various reward schemes (electric vehicles, metering companies, bike sharing schemes, etc).

Further to this, 2018 will also see the development of a battery trading exchange, which will allow the aggregation of energy storage devices to be traded to help balance the grid. Energi Tokens (ETK) will be used as the access currency for the platform. Our p2p trials will also commence in 2018, where we will be carrying out test trades on a new platform with our existing clients.

We will also be testing a range of technologies, including launching an MVP with RSK technology. In 2019, we will start to develop our IoT project, which will look at alternative technologies and partnerships with regards to finding the right solution for integration of billions of IoT devices.



## ROADMAP

The following diagram gives an idea of our schedule of development.



## 19. MEDIA



<https://www.forbes.com/sites/haroldstark/2017/10/27/brilliant-startups-are-using-icos-to-revolutionize-the-world-of-blockchain/#4090a1a74a79>

<https://www.forbes.com/sites/rogeraitken/2017/10/22/leveraging-bitcoin-blockchain-for-solar-power-sun-exchange-scores-1-6m-from-u-s-investors/>

<http://www.investopedia.com/news/upcoming-icos-worth-your-attention/>

<http://www.investopedia.com/news/ico-initial-coin-offering/>

<https://www.thetimes.co.uk/article/citizen-robot-marks-a-world-first-for-saudi-arabia-vjvmmtx3s>

<http://www.newsbtc.com/2017/10/09/startuptoken-tour-offers-unique-chance-meet-founders-innovative-blockchain-startups-asia-october/>

[https://issuu.com/icocrowd/docs/ico\\_crowd\\_2\\_for\\_issuu](https://issuu.com/icocrowd/docs/ico_crowd_2_for_issuu)

<http://www.dailymail.co.uk/sciencetech/article-4963612/Humans-BANNED-driving-25-years.html?ITO=1490>

<https://www.greenenergynews.co.uk/pioneers-energi-mine-set-change-way-energy-traded-consumed/>

<http://www.businesscloud.co.uk/news/new-cryptocurrency-rewards-energy-efficiency>

<http://www.the-blockchain.com/2017/09/27/oldham-based-energi-mine-set-become-first-uk-business-outside-london-raise-funds-token-sale/>

<http://www.businesscloud.co.uk/news/energi-mine-appoints-ai-robot-to-management-board>

<https://www.greenbiz.com/article/8-more-blockchain-experiments-you-should-watch>

<http://www.manchestereveningnews.co.uk/business/business-news/oldham-entrepreneurs-energi-mine-trade-13474391>

## 20. LEGAL DISCLAIMERS

This whitepaper is for information purposes only and may be subject to change. We cannot guarantee the accuracy of the statements made or conclusions reached in this whitepaper and we expressly disclaim all representations and warranties (whether express or implied by statute or otherwise) whatsoever, including but not limited to:

- any representations or warranties relating to merchantability, fitness for a particular purpose, suitability, title or non-infringement;
- that the contents of this document are accurate and free from any errors; and
- that such contents do not infringe any third party rights.

We shall have no liability for losses or damages (whether direct, indirect, consequential or any other kind of loss or damage) arising out of the use, reference to or reliance on the contents of this whitepaper, even if advised of the possibility of damages arising.

This whitepaper may contain references to third party data and industry publications. As far as we are aware, the information reproduced in this whitepaper is accurate and that the estimates and assumptions contained herein are reasonable. However, we offer no assurances as to the accuracy or completeness of this data. Although information and data reproduced in this whitepaper are believed to have been obtained from reliable sources, we have not independently verified any of the information or data from third party sources referred to in this whitepaper or ascertained the underlying assumptions relied upon by such sources.

As of the date of publication of this whitepaper, ETK tokens have no known or intended future use (other than on Energi Mine Limited's platforms to be developed).

No promises of future performance or value are or will be made with respect to ETK tokens, including no promise of inherent value, no promise of any payments, and no guarantee that ETK tokens will hold any particular value. Unless prospective participants fully understand and accept the nature of Energi Mine Limited's business and the potential risks associated with the acquisition, storage and transfer of ERC-20 token such as ETK tokens, they should not participate in the token sale.

ETK tokens are not being structured or sold as securities. ETK tokens hold no rights and confer no interests in the equity of Energi Mine Limited. ETK tokens are sold with an intended future use on Energi Mine Limited's platforms and all proceeds received during the token sale may be spent freely by Energi Mine Limited on the development of its business and the underlying technological infrastructure.

This whitepaper does not constitute a prospectus or disclosure document and is not an offer to sell, nor the solicitation of any offer to buy any investment or financial instrument in any jurisdiction. ETK tokens should not be acquired for speculative or investment purposes with the expectation of making an investment return.

No regulatory authority has examined or approved any of the information set out in this whitepaper. No such action has or will be taken under the laws, regulatory requirements or rules of any jurisdiction. The publication, distribution or dissemination of this whitepaper does not imply that applicable laws or regulatory requirements have been complied with.

**Participation in the token sale carries substantial risk and may involve special risks that could lead to a loss of all or a substantial portion of your contribution. Further information about the risks of participating in the token sale is set out in the Token Sale T&Cs. Please ensure that you have read, understood and are prepared to accept the risks of participating in the token sale before sending a contribution to us.**

The token sale and/or ETK tokens could be impacted by regulatory action, including potential restrictions on the ownership, use, or possession of such tokens. Regulators or other competent authorities may demand that we revise the mechanics of the Token Sale and/or the functionality of ETK tokens in order to comply with regulatory requirements or other governmental or business obligations. Nevertheless, we believe we are taking commercially reasonable steps to ensure that the token sale mechanics and issue of ETK tokens do not violate applicable laws and regulations.

#### Caution Regarding Forward-Looking Statements

This whitepaper contains forward-looking statements or information (collectively “forward-looking statements”) that relate to our current expectations of future events. In some cases, these forward-looking statements can be identified by words or phrases such as “may”, “will”, “expect”, “anticipate”, “aim”, “estimate”, “intend”, “plan”, “seek”, “believe”, “potential”, “continue”, “is/are likely to” or the negative of these terms, or other similar expressions intended to identify forward-looking statements. We have based these forward-looking statements on current projections about future events and financial trends that we believe are relevant to our financial condition, results of operations, business strategy, financial needs, or the results of the token sale.

In addition to statements relating to the matters set out here, this whitepaper contains forward-looking statements related to Energi Mine Limited’s proposed operating model. The model speaks to our objectives only, and is not a forecast, projection or prediction of future results of operations.

Forward-looking statements are based on certain assumptions and analysis made by Energi Mine Limited in light of its experience and perception of historical trends, current conditions and expected future developments and other factors it believes are appropriate, and are subject to risks and uncertainties. Although the forward-looking statements contained in this whitepaper are based upon what we believe are reasonable assumptions, there are risks, uncertainties, assumptions, and other factors which could cause our actual results, performances, achievements and/or experiences to differ materially from the expectations expressed, implied, or perceived in forward-looking statements. Given such risks, prospective

participants in the token sale should not place undue reliance on these forward-looking statements.