VenusEnergy WHITE PAPER

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INTRODUCTION

Bitcoin is a decentralized digital currency. It was invented by an unknown programmer or a group of programmers under the name Satoshi Nakamoto. This currency is not backed by any other currency, precious metals or other commodities and its rate is defined by supply and demand. The bitcoin market cap makes 65.31 billion US dollars. It is recognized that this digital currency is the most significant money revolution in all of human history. Bitcoins can be simply purchased (for that purpose, one must either install a special wallet or use one online) or earned through mining - using a so-called peer-to-peer (P2P) technology. In other words, in order to collect some pieces of this currency one must participate in a special network called Blockchain designed to **share computer resources and compute complicated mathematical tasks.** A total of 21 million bitcoins has been put into circulation, and all of them will be collected or "mined" by 2030. The number of people willing to earn bitcoins in the easiest way, which is through "mining" them using the increase in the price of bitcoins, is increasingly growing. Therefore, the competition between bitcoin "miners" is increasing as well. But, indeed, how is it decided who performs the work and who is the first one to receive a bitcoin for mining and earning money? Well, this is big money - each "miner" who successfully performs works, meaning that he or she has a successfully verified block, receives an award equal to 25 bitcoins, which is equal to approximately 84 150 USD. The developments of technology make new computers perform the "mining" works increasingly better and more rapidly, for which reason the block chain has to complicate the "bitcoin" mining works, because otherwise each desktop computer, which is available in almost everybody's house, will become capable of performing the computations required for the verification of a block, and hundreds of thousands of transactions will become verified in a second and all bitcoins will be "mined" in a day. For this reason, the block chain relies on the consensual algorithm called Proof of Work (PoW). In order to perform the tasks of this algorithm, extremely vast computer resources are required, while enormously big amount of electric energy is needed to maintain such hardware. **That is why it is quite often to hear that the bitcoin price depends on the electric energy price.** One of the qualities of electricity, which expressly distinguishes it from other energy sources, is that electricity is not the primary source of energy, it does not exist in nature but it has to be produced. Electricity is often produced with the use of heat engines received as a result of burning coal, household wastes and other sources of fuel. Such a method of energy extraction is extremely environmentallyunfriendly as more and more greenhouse gas is emitted into the environment, thereby increasing the greenhouse effect and exhausting the Earth. Although the temperature on Earth has been increasing for millions of years, nevertheless, the temperature rise in the recent times is deemed to be too fast. This is conditioned by ever increasing consumption, specifically, by the consumption of electric energy.

The global temperature increase will cause further changes: rising sea level, respectively increasing or decreasing yield of various crops, melting of glaciers, weakened river flows, extinction of species and increase of diseases carriers. In order to avoid and decrease the greenhouse effect and the emission of greenhouse gases into the environment, various steps have been taken. One of these steps is described in the Kyoto protocol, whose participants are countries willing to preserve the Earth and leave it for the upcoming generations as beautiful as it is now. Use of renewable energy sources may be one of the main methods to decrease the greenhouse effect. Such electric energy sources like sun, wind, geothermal heat are natural energy resources which appearance and renewal depend on the processes of the nature itself. **Renewable energy sources must be of great current interest for bitcoin miners.** Using of renewable energy sources for the production of electric energy, which is to be used for the performance of bitcoin mining works, significantly decrease expenses on electricity, meaning that profit received for the works performed is bigger. Also, this leads to saving nature and decreasing the greenhouse effect. The VenusEnergy team supports the idea of pure world and seeks to propagate the use of renewable energy sources in daily activities. The increase of bitcoin demand will also result in the increase of the scope of mining works, while using renewable energy sources in performing the works leads to saving nature, whereas the work is done in the same efficient manner. In an effort to support the idea – to use renewable energy sources for mining works – the VenusEnergy team crafted a plan of where to start from and what to do in order to preserve the world while keeping the bitcoins being mined. This idea is laid down in this document.

PROBLEM STATEMENT

BlockChain is a rapidly developing technology, which is turning the world upside down – people have to move from standard thinking about centralized systems to decentralization and advantages thereof. The BlockChain technology is an exclusive network in which every network participant has the whole network copy in its device, which secures safety, incontrovertibility, integrity of information, neutralizes the factor of single attack vector. However, such advantages also require both energy and computing capacities. In standard centralized systems these computing capacities are concentrated in the server and in the organization supervising over the central system; however, if we move to decentralization, who in such a circumstance will secure computation, who will provide energy and computer resources? The computations are ensured by so-called miners, i.e. people ready to contribute their computer resources in order for the network to be able to perform consensus algorithm works, thereby securing uninterrupted operation and receiving remuneration for it. From the theoretical perspective, it sounds good but in practice everything is completely different. The electric energy prices have hit an all-time high; the amount of transactions has become very big, which leads to overloading or slowing down even the most powerful computers. Also, the priority to perform block computation works in a network are distributed according to the available computing resources, which concentrate in so-called farms, pools, and Blockchian computation is becoming centralized and monopolized - polar opposite than stated in the blockchain theory. So who, indeed, conditions such computing distribution tendencies? Expensive electricity? The need in especially big computer resources to perform computations? It does not pay to mine bitcoins at home as:

- The consumption of electric energy is becoming very big, while the remuneration received for the performed computations is not big enough to defray the incurred electric energy expenses.

- Also, a home computer with its computing capacities cannot compete with the powerful devices available at computing farms.

Therefore, what, indeed, complicates the computing works? The Bitcoin computing work is aimed at searching for cryptographic hash values. Blocks are cryptographically hashed and according to these hash values they are associated with each other thereby creating a blockchain. The consensus algorithm ensures that the blocks hash values are really correct, verifies that the block which goes after the preceding block is real and assigns it to the whole chain.

The consensus algorithms

The consensus mechanism maintains the sanctity of the data recorded on the blockchain. The blockchain system will safeguard the transaction and block order thereby

safeguarding all the key properties of blockchain, such as immutability and auditability only when the underlying assumptions are correct and the consensus model can uphold the state of the blockchain under failure and adversarial conditions. Poor choice of a consensus mechanism can render the blockchain platform useless thereby compromising the data recorded on the blockchain. Below are some of the issues that can result when the consensus mechanism fails:

- **Blockchain Fork** – A blockchain fork can result in different nodes in the system converging on different blocks as being part of the blockchain. In Bitcoin, though temporary forks may exist due to network latencies, the protocol is designed such that all nodes will eventually converge on a single chain. A blockchain fork can wreak havoc on applications leading to completely inconsistent view of data recorded on the blockchain thereby forcing applications to behave in an unpredictable manner. The Stellar network, which originally forked code from Ripple, experienced a fork in the Stellar blockchain due to a misconfiguration.

- **Consensus Failure** – Certain consensus algorithms may not guarantee the ability to reach consensus. For e.g. if the consensus algorithm requires a super-majority vote from a certain percentage of nodes, failing to reach this number because of node or network failures, non-compliant nodes or as a result of valid honest nodes not being able to make a decision due to inconsistent messages received from other nodes, may result in consensus failure.

- **Dominance** – Consensus round outcomes can be manipulated by a single or group of entities if it is not designed to be resilient against Sybil attacks, where one or handful of nodes can generate millions of identities that they control. Having such dominance allows the dominating group to confirm the transactions and blocks as per their rules, even include transactions that can double-spend the cryptocurrency. Dominance can also be achieved by other means, such as controlling 51% of mining power in a PoW network.

- **Cheating** – Validating nodes either individually or in collusion can independently maintain parallel forks in the blockchain of fraudulent transactions or altered reality that can been provided as proof to the auditor or external third party. The consensus and blockchain reading mechanism has to ensure that such attacks cannot be carried out on the blockchain platform.

- **Poor Performance** – Based on the design of the consensus algorithm, it may require more time under certain conditions for consensus to converge. These conditions could be dynamic where other nodes have turned malicious or a network partition may delay messages that are exchanged between nodes, etc. This may manifest as inconsistently high latencies in applications. There are many consensus algorithms but the goal of them all is to ensure the consistent operation and security that the transactions are real, unfalsified and that the mined block is also real and unfalsified.

These are the most popular consensus algorithms:

- Proof of Work (PoW);
- Proof of Stake (PoS);
- Proof of Elapsed Time;
- Byzantine fault tolerance and variants;
- Federated Byzantine Agreement.

How to mine

The work performed when computing the consensus algorithms is called mining. It is often to hear an expression "to mine bitcoins". So what is needed in order to mine bitcoins, contribute to consistent network operation and make computations? Further we will discuss the mining requirements to the Proof of Work (PoW) algorithm, what is needed and how difficult it is to start mining bitcoins, what software and hardware is necessary to become a competitive miner. For the analysis, we have chosen the bitcoin blockchain network as the bitcoin network is the first and currently the most popular BlockChain network in the world, and the bitcoin cryptocurrency value is the biggest among the other cryptocurrencies, wherefore it pays to mine this currency the most. In the below provided table you can see the bitcoin specification.

	Bitcoin
Coin limit	21 Million
Algorithm	SHA-256
Mean block time	10 minutes
Difficulty retarget	2016 block
Block reward details	Halved every 210,000 blocks
Initial reward	50 BTC
Current block reward	25 BTC
Block explorer	Blockchain.info
Created by	Satoshi Nakamoto
Creation date	January 3rd, 2009
Market cap	$10,467,596,650.78
	Bitcoin Statistics

The process of mining digital currencies involves solving complex cryptographic puzzles. By doing this, miners are providing „proof of work" that is rewarded with digital currency. Broadly speaking, there are two proof-of-work hashing algorithms in use today: SHA-256 and scrypt. Note that there are some lesser-used alternatives, which we will not be looking at in this guide (for example, Primecoin).

- **SHA-256** The SHA-256 algorithm favours raw processing power. In bitcoin's very early days, one could mine effectively with the CPUs and GPUs (graphics processing units)

that you find in a normal home PC. That time has passed, however, and the difficulty level of bitcoin is so high that specialised processors known as 'Application Specific Integrated Chips' (ASICs) are needed to mine it. The use of such powerful processors, along with bitcoin's exponential increase in difficulty level, have created a technological arms race, which means that even quite recently designed chips can quickly become obsolete.

• **Scrypt** The scrypt algorithm favours greater amounts of RAM and parallel processing ability, which is why GPU-based rigs are still the way to go. Furthermore, ASICs for scrypt have yet to take off, so the difficulty level of those currencies has not been pushed up as dramatically as has been the case with bitcoin.

Hadware for minig bitcoins

CPU/GPU Bitcoin Mining: The least powerful category of bitcoin mining hardware is your computer itself. Theoretically, you could use your computer's CPU to mine for bitcoins, but in practice, this is so slow by today's standards that there isn't any point. You can enhance your bitcoin hash rate by adding graphics hardware to your desktop computer. Graphics cards feature graphical processing units (GPUs). These are designed for heavy mathematical lifting so they can calculate all the complex polygons needed in high-end video games. This makes them particularly good at the SHA hashing mathematics necessary to solve transaction blocks. You can buy GPUs from two main vendors: ATI and Nvidia. High-end cards can cost hundreds of dollars, but also give you a significant advantage over CPU hashing. For example, an ATI 5970 graphics card can give you over 800 MH/sec compared with a CPU, which will generally give you less than 10 MH/sec. One of the nice things about GPUs is that they also leave your options open. Unlike other options discussed later, these units can be used with cryptocurrencies other than bitcoin. Litecoin, for example, uses a different proof of work algorithm to bitcoin, called Scrypt. This has been optimized to be friendly to CPUs and GPUs, making them a good option for GPU miners who want to switch between different currencies.

GPU: Mining is largely dead these days. Bitcoin mining difficulty has accelerated so much with the release of ASIC mining power that graphics cards can't compete. If you do want to use them, you'd best equip yourself with a motherboard that can take multiple boards, to save on running separate PSUs for different boards.

FPGA Bitcoin Mining: A Field Programmable Gate Array is an integrated circuit designed to be configured after being built. This enables a mining hardware manufacturer to buy the chips in volume, and then customize them for bitcoin mining before putting them into their own equipment. Because they are customized for mining, they offer performance improvements over CPUs and GPUs. Single-chip FPGAs have been seen operating at around 750 Megahashes/sec, although that's at the high end. It is of course possible to put more than one chip in a box.

ASIC Bitcoin Miners: This is where the action's really at. Application Specific Integrated Circuits (ASICs) are specifically designed to do just one thing: mine bitcoins at mind-crushing speeds, with relatively low power consumption. Because these chips have to be designed specifically for that task and then fabricated, they are expensive and time-consuming to produce - but the speeds are stunning. At the time of writing, units are selling with speeds anywhere from 5-500 Gigahashes/sec (although actually getting some of them to them to ship has been a problem). Vendors are already promising ASIC devices with far more power, stretching up into the 2 Terahashes/sec range.

The right rig: Depending on your budget and the type of currency you intend to mine, there are two ways to go when setting up your mining system:

DIY mining rig: These can be built from your own PC, with as many graphics cards (ie: GPUs) as you can fit or afford. While some people may use a standard PC case, many use unusual casings, such as beer crates, which allow for increased air flow around the components. A bonus of DIY systems is that you can carry out both CPU and GPU mining at the same time (see our guide to mining altcoin).

ASICs: ASICs are self-contained units (power adapters not withstanding), which come with a USB and/or Ethernet port, and are usually ready made by manufacturers. ASIC miners are usually more expensive than DIY rigs and are mostly produced in the USA, which means those of us in other parts of the world will have to spend a little extra to get them imported.

Software

Depending on which equipment you choose, you will need to run software to make use of it. Typically when using GPUs and FPGAs, you will need a host computer running two things: the standard bitcoin client, and the mining software.

Standard bitcoin client: This software connects your computer to the network and enables it to interact with the bitcoin clients, forwarding transactions and keeping track of the block chain. It will take some time for it to download the entire bitcoin block chain so that it can begin. The bitcoin client effectively relays information between your miner and the bitcoin network.

Bitcoin mining software: The bitcoin mining software is what instructs the hardware to do the hard work, passing through transaction blocks for it to solve. There are a variety of these available, depending on your operating system. They are available for Windows, Mac OS X, and others. You may well need mining software for your ASIC miner, too, although some newer models promise to ship with everything pre-configured, including a bitcoin address, so that all you need to do is plug it in the wall.One smart developer even produced a mining operating system designed to run on the Raspberry Pi, a low-cost credit card-sized Linux computer designed to consume very small amounts of power. This could be used to power a USB-connected ASIC miner.

Energy assumptions

Use these two factors to work out how many hashes you're getting for every watt of electricity that you use. To do this, divide the hash count by the number of watts. For example, if you have a 500 GH/sec device, and it's taking 400 watts of power, then you're getting 1.25 GH/sec per watt. You can check your power bill or use an electricity price calculator online to find out how much that means in hard cash Mining requires electricity – lots of electricity. If you are building a DIY rig, you'll be getting an ATX power supply unit (PSU) anyway, so it's worth investing in the most efficient supply you can get. Consider the following two cases, for example: A PSU that is guaranteed to supply 860W and is 93% efficient would actually draw 925W (860W/0.93). By contrast, a 750W power supply that is only 80% efficient would actually draw 937.5 W (750/0.8) – thus using more power, but supplying less. When building a mining rig, you will need to take account of the power requirements of all the components you are using – especially all those graphics cards. Plus it's a good idea to provide some excess capacity to deal with unexpected events and provide the potential to overclock your system. ASICs, on the other hand, can do far more calculations with far less power because they are highly specialised devices. And since they ship with an appropriate power adapter, you won't have to worry about doing all the maths to find one that is up to the task. The mining efficiency of different systems can be compared by taking the ratio of the number of hashes it can perform in a second, divided by the power it consumes:

Hashing speed / power consumption = mining efficiency

Whichever way you mine, it's a computationally intensive operation that creates lots of excess heat. Mining efficiency decreases as temperature increases, so make sure your rig has adequate ventilation and cooling. This is why some mining rig builders use beer crates rather than PC cases – to maximise airflow around their components. Even a standalone desktop fan can help to keep your kit cool. When building a DIY mining rig, it doesn't make sense to save money by buying a cheap PSU. Any instability in the power supply could hit performance, or even cause a system crash that will lead to downtime, so do invest in a highquality unit.

Avoiding downtime: If your hardware isn't mining, you are losing money. Here are some ways to minimise downtime: Get the best power supply you can afford. Consider using an uninterruptible power supply (UPS), so that, if your electricity supply cuts out for a moment, it won't affect your miner. Configure your mining computer to automatically start mining on start-up, so that if the system crashes and reboots, it will automatically start mining again. (This applies to DIY rigs and computers hosting an ASIC.)

Pollution received as a result of the production of electric energy in thermal electric power stations

The earnings from mining depend on the price of electric energy and the probability to receive a computed hash value. This probability, in its turn, depends on the amount of the computing capacities. Currently, for a blockchain user it does not pay to have a bitcoin computing equipment at home. But let‘s think about such a situation – what if we could receive energy from “air“ – in the direct sense of the word? What if the electric energy would be produced by solar batteries, wind power plants? Renewable energy sources make as little as 19 % in the electric energy production, of which 16 % is produced by hydroelectric power stations and 3 % − from other sources. Why is not it popular nowadays? Why do we still get the major part of the electric energy from the thermal power plants? Renewable energy recovery is expensive as the devices making it possible to efficiently recover energy from renewable energy sources are expensive and their efficiency is not significant. But what if we succeed in reversing the trend?

Thermal power plants are the most common type of power plants in the world. They are most typically fueled by mineral fuel (oil products, bituminous coal, natural gas and etc.), biofuel, community and industrial wastes. Thermal power plants prevail in the countries which have a sufficient amount of fossil fuel or import it in large quantities. The fossil-fuel-rich countries produce energy only in thermal power plants (UAE, Kuwait, Qatar and etc.). The advantages of a thermal power plant: non-complicated and inexpensive construction, suitableness to be mounted near the cities with a large quantity of users, consumption of different fuel, relative safeness. Disadvantages: consumption of dwindling resources, dependence on the transport, **relatively expensive production of energy, significant pollution.**

Thermal and nuclear power plants, other enterprises, which supply and use electric energy and heat, emit a significant amount of heat into the environment. It is general practice to use water from natural bodies of water, which is returned to them afterwards, for cooling the electric power plants‘ machinery. The warm water discharged into these bodies of water (which are called coolers), especially when it contains biogeneous, toxic and other substances, upsets the biological balance of ecosystems: breeds pathogenic and dangerous infectious agents, adverse organisms obstructing to normally operate the power plants. The cooler‘s water temperature rises; more water vapours out; the water level falls during the summer; its hydrochemical qualities as well as environment microclimate change; metabolic processes of biogeneous materials (eutrophication) speed up; the sanitary water condition worsens.

The thermal power plants often have heat excess, which is discharged into the air through chimneys, thereby polluting the air, which is perfectly shown in picture No. 1.

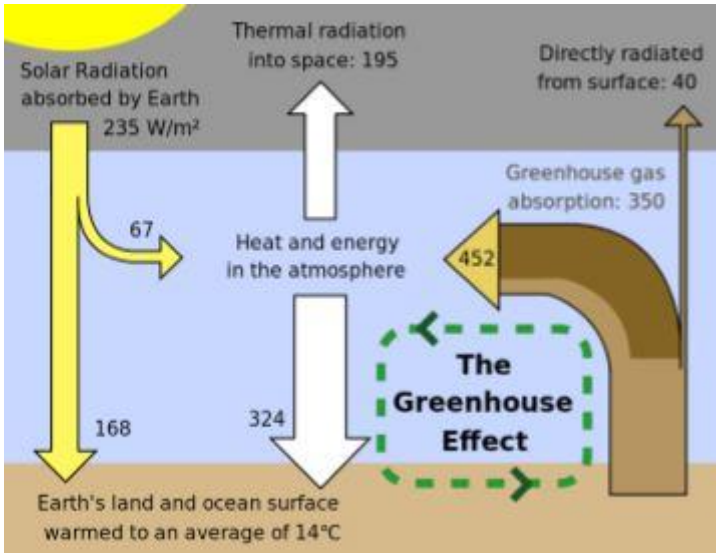
Picture No. 1. Air pollution by heat power plants

All thermal power plants produce waste heat energy as a byproduct of the useful electrical energy produced. The amount of waste heat energy equals or exceeds the amount of energy converted into useful electricity. Gas-fired power plants can achieve as much as 65 percent conversion efficiency, while coal and oil plants achieve around 30 to 49 percent. The waste heat produces a temperature rise in the atmosphere, which is small compared to that produced by greenhouse-gas emissions from the same power plant. Natural draft wet cooling towers at many nuclear power plants and large fossil fuel-fired power plants use large hyperboloid chimney-like structures that release the waste heat to the ambient atmosphere by the evaporation of water.

Such significant discharge of harmful greenhouse gases into the air encourages the greenhouse effect, which causes irreversible effects for the earth and ever-augmenting global warming. The greenhouse gases are gases which are present in the atmosphere and absorb a part of the infrared radiation going into the atmosphere. Some of them are a natural part of the atmosphere, while the others end up in the atmosphere due to the human activities. Among these are water vapours (the biggest amount), ozone (O_3), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), halocarbons (chlorofluorocarbons CFC). The sources of these gases are various – from natural processes to the activities of people themselves.

After the industrial revolution, the humanity is becoming increasingly responsible for the ever-rising level of carbon dioxide in the atmosphere. The humanity needs more and more energy resources. Although the alternative resources gain more and more popularity, for the time being they hardly make several percent in the world‘s energy resources. Many environmental organizations accuse the USA of not signing the Kyoto protocol. China, which continues developing its wind-driven energy infrastructure, for the time being disagrees to undertake to decrease the greenhouse effect, asking for the economic support from the other countries. The increasing use of slowly recoverable and limited as well as non-ecological energy resources, such as coal and oil, is becoming more and more problematic in terms of impact not only on climate but also on health of humans and other animals as well as ecosystems. The ever-increasing amount of carbon dioxide in the atmosphere causes adverse processes: ocean acidity rises (during the period from 1751 to 1994, the ocean pH dropped from 8.179 down to 8.104), the carbon cycle becomes adversely affected. The greenhouse gases absorb a part of the infrared rays hitting the atmosphere and reflect them back to the environment, thereby detaining the heat near the surface of the earth. Some of the greenhouse gases appear in the atmosphere naturally, while the others are increasing as a result of the human activity. The latter gases are called anthropogenic greenhouse gases. The increase of the concentrations of the anthropogenic greenhouse gases is deemed to be the main reason for global warming and greenhouse effect.

The greenhouse effect is a process leading to global warming as a result of the absorbtion of the infrared radiation by the atmosphere. The Earth receives energy from the Sun in the form of rays. The energy which is not absorbed by the Earth‘s atmosphere and surface returns to the space. This takes place in two ways – by reflecting the solar rays and by emitting the infrared rays (heat) by the surface of the Earth. By the first way the Earth reflects approximately 30 % of the received flood of the solar rays, the remaining 70 % are absorbed through heating the Earth with its atmosphere, oceans and etc., being basically the energy source for the processes on the Earth (including the life processes). The heat absorbed and not used by the Earth surface emanates back to the atmosphere. Due to the greenhouse gases which keep the infrared radiation, the atmosphere gives out only a part of this energy to the space. The remaining part is returned to the surface of the Earth. The greenhouse effect is shown in picture No. 2.



Picture No. 2. The scheme of greenhouse effect

If the Earth had no atmosphere, its surface would heat up only to -18 °C in average, while the real average temperature is approximately 15 °C. Therefore, natural greenhouse effect is important for the Earth processes and climate. However, as a result of the accelerated industrialization during the last century, the carbon dioxide, methane, nitrous oxide and other gases emitted into the atmosphere affect the established balance, thereby causing the threat of global warming.

Global warming is an increase in the overall temperature of the earth‘s atmosphere near the surface and oceans recorded during the last decades. During the XX century, the average world‘s temperature increased by 0.74 ± 0,18 °C. Although during the million years period the temperature on the planet was constantly increasing, the latter heating is deemed to be too sudden and attributed to the greenhouse effect caused by the human activities. Greenhouse gases heating the earth surface and lower layers of the atmosphere are emitted as a result of burning the useful minerals. The global heating effects. Some changes, at least partly associated with the global warming, are already noticeable in the people‘s life and natural environment. These are melting of glaciers, destruction of ice barriers, rising of sea level, changes of the amount and distribution of precipitations, increase in the frequency of hurricanes and other extreme weathers. Inasmuch as the heating conditions general tendencies, intensiveness and frequency, it is hard or even impossible to attribute heating as a cause of specific phenomena. The following global heating effects are expected: rise of sea level by 11-77 cm by the year 2100, big adverse impact on the world‘s agriculture, possible deceleration of thermohaline circulation, ozone layer depletion, intensification and increase of frequency of hurricanes and other extreme weathers, increase of ocean acidity, increase of frequency of various diseases (such as malaria) and epidemies, massive extinction of biological species. One research predicts that on the assumption that the climate will change as forecasted in the models, 18–35 % of 1103 species of animals and plants researched will become extinct by the year 2050.

“I think that the risk that the current climate regulation actions will not be enough makes as much as 50 per cent.“ - Thomas Schelling, Maryland University professor. The World Meteorological Organization and the U.S. Environmental Protection Agency predict more frequent disasters related to meteorological phenomena and caused by drastic weather changes as well as density of population. The probability and scope of these effects are hard to predict due to the myriad of factors and inability to define the impact of such factors as economy, technologies and social development, wherefore the said effect should be interpreted as a probability but not as a statement.

The VenusEnergy team does not want to wait for such drastic global changes to come, it does not want to sit and watch the world self-destruct. Also, one of our goals is to encourage mutual communication between the people without interference of any middlemen, which is perfectly illustrated by the blockchain network and bitcoin idea. Therefore, VenusEnergy offers to use renewable energy sources in performing the computing works in a blockchain network. This will be one small step towards a better and purer life of humanity and a big step for the new blockchain technology with the increased computing capacities assisting it to become massively used and sustain competition with the modern systems, such as, e.g., payment systems, in less time**. If you choose to use the solution we offer, the mining works will become cheaper with more people able to perform them; the land resources will be saved and the greenhouse gases as well as global warming will be decreased.**

SOLUTION

To address the problem desribed above, the VenusEnergy team offers a solution involving the use of renewable energy sources. Using renewable energy sources to perform computations would be a revolutionary solution as:

1. The bitcoin mining price, which is currently formed on the basis of relations between the electric energy price and computer capacities, would be simplified to the mere computer capacity value. The electric energy price would not affect blockchain network computations so badly, which would enable to expand the number of people and equipment to perform computations. This would encourage the network, transactions, raise the security level; the network would develop and reach a productive version more quickly; and the revolutionary technology could become competitive to the technologies prevailing at the moment.
2. Renewable energy sources and their use decrease global warming and the emission of greenhouse gases into the atmosphere, which improves the condition of the earth from different perspectives. Computations of the entire bitcoin blockchain network consume as much energy as a medium sized country such as Denmark or Ireland. But, as predicted, the implementation of the VenusEnergy offer would lead to more and more people mining using renewable energy sources, which would essentially contribute to the idea of pure earth.

Therefore, using renewable energy sources in the performance of blockchain mining works could be a good beginning and example to shift to renewable energy souces in the other areas as well. The mass use of renewable energy sources would also contribute to encouraging the industry; increasingly more solar collectors and wind power plants would be produced; these technologies would develop and their quality and efficiency would improve as well.

Renewable energy sources

Renewable energy sources (RES) are natural energy resources which origination and renewability are conditioned by natural phenomena: sunshine, wind, river flow, sea waves, rise and fall of the ride, biomass growth, geothermal energy and etc. The primary source of almost all renewable energy sources is solar energy. Globally, the RES make approximately 16 % of the whole amount of energy consumed. The major part is biomass used as a fuel (e.g. wood); however, the use of solar energy, wind energy, wave energy and other types of RES is rapidly growing as well. RES make 19 % in the electric energy production, of which 16 % is received from hydroelectric power stations and 3 % − from other sources. The use of RES is rapidly growing in the Northern and Sourhern America, Europe and Asia. Among the RES, wind and solar energy sectors are especially popular.

According to the installed capacities, the biggest renewable energy users are China, USA and Germany. Rapid growth is observable in South Korea, Australia, France and other countries. The main RES types are as follows:

- Wind energy - the use of air flow both on land and in open sea or ocean for actuating wind turbines to generate electric power;
- Solar energy - the use of sunshine for boiling water, producing electric power with the help of solar batteries;
- Biofuel - the use of plant biomass to produce heat and electric energy;
- Biofuel is ethanol, dieseline or methane received from biomass;
- Geothermal energy - the use of heat in the interior of the earth.

VenusEnergy is planning to concentrate its activities in the wind and solar energy sectors.

Wind energy is the power of air flow. According to the calculations, 1-3 % of solar energy which reaches the earth is converted into the wind energy. This is 50-100 times as a big amount of energy as converted into the biomass energy as a result of the photosynthesis process. The major part of this energy materialises in the higher air layers, where winds ~160 km/h are blowing on a constant basis. Eventually, the wind energy, as a result of air friction, becomes air heat. In wind power engineering, wind power is the use of air flow through wind turbines to mechanically power generators for electric power. It is one of the least environment-harming energy branches. However, even it harms the environment. Birds (especially rare birds of prey), including bats, are beaten down by the running rotors of wind power plants. This problem is especially timely on the bird migration roads. Seeing dead birds beaten down by the rotors of wind power plants, i.e. food, birds of prey slowly come down until the rotors kill them as well. In 2005, wind energy made 1 % (or 58 982 MW) of all electric energy produced in the world. Electric power produced from using wind turbines makes 23 % of electric energy in Denmark, 8 % in Spain and 4.3 % in Germany. In the 19992005 period, the amount of wind energy produced in the world increased as much as fourfold. As compared with the conventional electric energy production methods using solid, liquid, gas fuel, which requires heavy disimbursement for the fuel to be received from the interior of the earth, delivered to the electric power plants, burnt and for the ashes to be removed, for the smoke to be cleared, for the water in collants to be boiled and for the air pollution to be decreased, wind power plants do not require such expenses. However, it is often to hear an incorrect opinion that wind is an energy resource that costs nothing and that the electric energy generated in a wind power plant costs nothing as well. Unfortunately, wind power plants are expensive. Expensive is their mounting and connection to the system electric network, including land purchase for construction, hard roads laying on land, heavy elements‘ transportation to construction site, complex mounting works, construction of transformer buildings,

cabling, connection to electric network, commissioning and start-up, and etc. The wind electric plants maintenance in operation is not cheap as well as it has to be carried out in accordance with strict directions of the manufacturers. An electronically-equipped wind power plant must be maintained by specially trained specialists able to find reasons of any possible defects and eradicate them very rapidly.

Solar energy is radiant light and heat from the Sun that is harnessed using a range of ever-evolving technologies such as solar heating, photovoltaics, solar thermal energy, solar architecture, molten salt power plants and artificial photosynthesis. It is an important source of renewable energy and its technologies are broadly characterized as either passive solar or active solar depending on how they capture and distribute solar energy or convert it into solar power. Active solar techniques include the use of photovoltaic systems, concentrated solar power and solar water heating to harness the energy. Passive solar techniques include orienting a building to the Sun, selecting materials with favorable thermal mass or light-dispersing properties, and designing spaces that naturally circulate air. The large magnitude of solar energy available makes it a highly appealing source of electricity. The United Nations Development Programme in its 2000 World Energy Assessment found that the annual potential of solar energy was 1,575–49,837 exajoules (EJ). This is several times larger than the total world energy consumption, which was 559.8 EJ in 2012. In 2011, the International Energy Agency said that "the development of affordable, inexhaustible and clean solar energy technologies will have huge longer-term benefits. It will increase countries' energy security through reliance on an indigenous, inexhaustible and mostly import-independent resource, enhance sustainability, reduce pollution, lower the costs of mitigating global warming, and keep fossil fuel prices lower than otherwise. These advantages are global. Hence the additional costs of the incentives for early deployment should be considered learning investments; they must be wisely spent and need to be widely shared". Solar power is the conversion of sunlight into electricity, either directly using photovoltaics (PV), or indirectly using concentrated solar power (CSP). CSP systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. PV converts light into electric current using the photoelectric effect. Solar power is anticipated to become the world's largest source of electricity by 2050, with solar photovoltaics and concentrated solar power contributing 16 and 11 percent to the global overall consumption, respectively. In 2016, after another year of rapid growth, solar generated 1.3% of global power. Commercial concentrated solar power plants were first developed in the 1980s. The 392 MW Ivanpah Solar Power Facility, in the Mojave Desert of California, is the largest solar power plant in the world. Other large concentrated solar power plants include the 150 MW Solnova Solar Power Station and the 100 MW Andasol solar power station, both in Spain. The 250 MW Agua Caliente Solar Project, in the United States, and the 221 MW Charanka Solar Park in India, are the world's largest photovoltaic plants. Solar projects exceeding 1 GW are being developed, but most of the deployed photovoltaics are in small rooftop arrays of less than 5 kW, which are connected to the grid using net metering and/or a feed-in tariff.

In the last two decades, photovoltaics (PV), also known as solar PV, has evolved from a pure niche market of small scale applications towards becoming a mainstream electricity source. A solar cell is a device that converts light directly into electricity using the photoelectric effect. The first solar cell was constructed by Charles Fritts in the 1880s. By 2012 available efficiencies exceeded 20%, and the maximum efficiency of research photovoltaics was in excess of 40%.

Potential

Solar energy. In a middle-term perspective, the economic solar energy potential covers the production of hot water (0.5 TWh), drying of agricultural commodities with the use of solar energy (0.8 TWh), and passive solar heating of premises (1.25 TWh). In a long-term perspective, solar heating may be used for central heating during summer seasons; photovolt systems may assume importance in the electric energy production. It is expected that the use of solar energy will reach 0.0012 TWh by 2020: these numbers are rather far from the established economic potential.

Wind energy. The established 0.85 TWh per year wind energy potential is substantiated by the supposition that the wind power plants in the continental part may be additionally constructed up to 500 MW. This is the limit, which cannot be overcome without additional expenses for the electric energy network reconstruction. It was established that the potential would be used prior to 2020. After 2020, a part of wind power plants may be reasonably constructed in sea, where the wind conditions are the best.

The relation between the renewable energy sources and heat energy is clearly seen in the tables below:

Nuclear energy

Advantages	Disadvantages
No environmental pollution by CO2 gases; Generally, NE works in a basic load mode, wherefore due to the coefficient of the use of high installed capacities the costs for the production of one kilowatthour of electric energy are relatively lower than the ones of electric power stations of other type; Fuel component in the price of electric energy is low; The amount of fuel is sufficient – it is present in the politically steady countries; moreover, it is possible to stock up with this fuel for a long time period; Encourages scientific progress; Formation of relatively low amount of wastes; Low operating costs;	Big initial investments; Resources necessary for long-term radioactive wastes processing

Bituminous coal

Advantages	Disadvantages
The amount of the resources is sufficient. Bituminous coal is the most widely used primary energy source to generate electric energy in the world; High coefficient of the use of the installed capacity; Initial investments are lower than those in NE; The opportunity to produce both electric and heat energy.	Environmental pollution; strongly contributes to acid rains and global warming; Requires well-developed transport system; high transportation costs; Practically impossible to accumulate reserves for a longer period of time; Requires good and expensive cleaning equipment in order to avoid oxidizing gases' emission into the environment.

Gas/oil

Advantages	Disadvantages
Developed supply infrastructure (as to the current consumption levels); Diversity of technological solutions, convenience for the users; Opportunity to produce both electric and heat energy.	Limited resources; Contribution to global warming; Becoming too expensive to produce electric energy; Big fluctuation of prices.

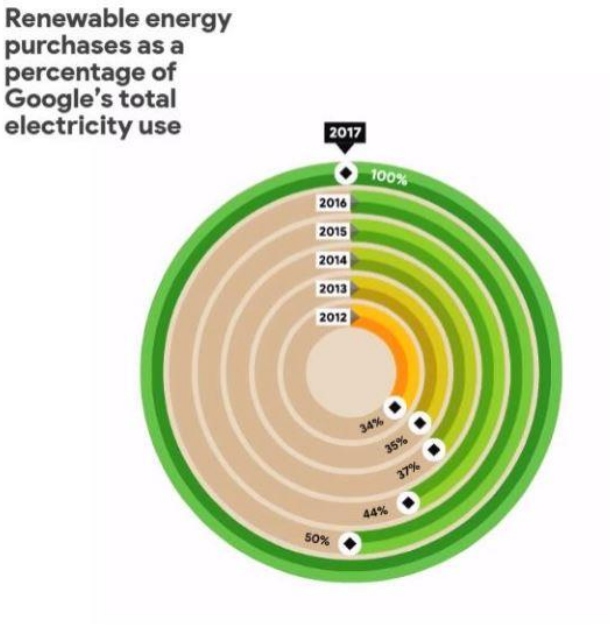
Windy energy

Advantages	Disadvantages
An environmentally friendly renewable energy source; Low operating costs.	Depends on natural conditions (wind), low coefficient of the use of installed capacity; Big initial investments; Generators' power is relatively low, wherefore a big amount of generators is required; Requires relevant power reserves to compensate wind energy fluctuations, which may essentially impact the final price of electric energy; Changes landscape and waterscape; Can contribute to the extinction of bird species.

Solar energy

Advantages	Disadvantages
Renewable energy source; Low operating costs; Opportunity to produce both electric and heat energy (different equipment is required).	Effective only in sunny places; Production use of special materials which are able to harm environment; Given the modern technologies, big land areas are required for the production of even small electric energy amounts.

The biggest world companies, such as Google, use renewable energy sources in increasing frequency. In 2017, Google is planning to completely shift to using renewable energy sources in its activities. The picture below shows renewable energy purchases as a percentage of Google's total electricity use:



If even such a company like Google puts efforts to use only renewable energy sources to generate 100 % of electric energy it consumes, then, maybe, such a global payment network like Bitcoin needs to make use of this pattern too? **The idea of the VenusEnergy team is to use as much energy generated from renewable energy sources for bitcoin blockchain network computations as possible.** We cannot achieve this goal all by ourselves; it is needed to engage society, bitcoin and other blockchain networks' communities. For this purpose, support and funds are needed. To collect funds, to rally likeminded persons' community and to disseminate the idea, the VenusEnergy team chose one of the most popular fund-collection methods – ICO.

What does this ICO, which shakes up the whole moneyed interest lately, stand for? And why is it useful for this project?

Initial coin offering (ICO) is a concept used in crowdfunding projects in the cryptocurrency and Blockchain industry. The term is often confused with a 'token sale' or crowd sale, which refers to a method of selling individuals the right to participate in an economy, giving investors access to the features of a particular project that will start at a later date. ICOs, on the other hand, sell the right of ownership or royalties to the project. According to Amy Wan, a partner at Trowbridge Sidoti LLP that practices crowdfunding and syndication law, "The coin in an ICO is a symbol of an ownership interest in an enterprise — it is a digital stock certificate, if you will." In contrast to initial public offerings (IPOs), where the investors gain shares in the ownership of the company, with ICOs the investors buy the coins of the company, which can subsequently appreciate in value if the business is successful.

ICO trends. ICOs have experienced a significant rate of growth in 2014-2016, with the overall funding rising from $26 million to $222 million. One of the very first ICOs, Mastercoin, has managed to secure $5 million worth of Bitcoins. Subsequently, many other tech companies have followed Mastercoin's model. In mid-August, 2017, there were 157 rised ICOs and more than $2.1 billion had been spent on funding. According to the State of Blockchain, Q1, 2017 that was published by Coindesk, ICOs and token sales currently capture a third of VC funding with major growth anticipated in the near future. New structures of ICOs are continuing to emerge as early stage fundraising mechanisms spawned by blockchain technology. Just as new ICOs are emerging every day, the incumbent enterprises are becoming more active in moving to blockchains, while token sales are starting to challenge traditional VC funding. The ICO market is growing exponentially, with $168 million in crowdfunding resulting in a market capitalization of $4.5 billion. Forbes The time during which an ICO will accept funds from backers has been dropping rapidly, with the most popular ICOs receiving their allotted funds in hours, if not minutes. Forbes

CONCLUSION

The VenusEnergy ICO goal is to allocate the collected money for researches of how to increase the effeciency of plants capable of generating electricity from renewable energy sources. For the ICO-raised funds, the RnD projects aimed at optimizing the application of renewable energy sources in daily activities, which is increasing the efficiency of solar collectors and making wind energy more available for everyone, will be drafted.

The second goal is to allocate the ICO-collected money for generating energy from renewable energy sources, i.e. mounting solar collectors and wind power plants, which generate electricity to be provided to the people engaged in blockchain network computations. This also includes the creation of energy sharing and mining platforms.

Well then, what kind of benefits, will the VenusEnergy investors receive? VENUS token holders would receive energy produced from renewable energy sources; they would also receive mining platform capacities. It means that the VenusEnergy holders will be able to buy mining power in VenusEnergy platform much cheaper than it will cost using other currencies. The discount for VENUS token holders may be between 20% and 30%.

Also, the VENUS currency is expected to be included into the currency exchanges and the virtual VENUS currency holders will be able to earn from fall and increase in currency exchange rate, applying day trading methods.

This is how we will contribute to the solution of the global warming problem starting from ourselves. We hope this good practice will be echoed in the other mining platforms and other spheres of life as well.

Based on the current ICO popularity, the funds expected to be collected will be raised during 6 months. After the VenusEnergy currency hits the currency exchange, its sale would contribute to collecting the outstanding amount needed to start up the project. It is expected to launch the project in the fourth quarter of 2019.

FOR MORE INFORMATION

More information about project is it the website: https://venusenergy.io
We friendly communicate through social networks:
Facebook: https://www.facebook.com/VenusEnergyToken/
Tweeter: https://twitter.com/Venus_Energy
We gladly will answer any questions related to the project through e-mail:
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