

FUTURE GRAPHENE NETWORK

WHITEPAPER

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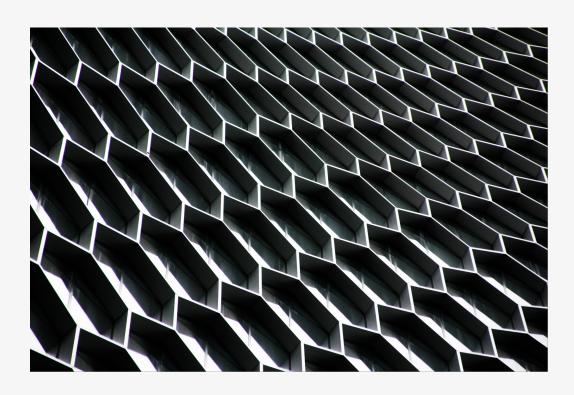
STRONGER THAN STEEL, THINNER THAN PAPER, GRAPHENE COULD BE THE FUTURE OF TECHNOLOGY



WHAT IS GRAPHENE?

STRONGER THAN STEEL, THINNER THAN PAPER, GRAPHENE COULD BE THE FUTURE OF TECHNOLOGY

Technological advances drive the course of history. Bronze and iron were so crucial to the spread of ancient societies that they have entire epochs named after them. With the rise of the American steel industry, railroad tracks spread from Atlantic to Pacific, metal veins that carried the blood of a nation. Silicon semiconductors enabled the growth of computers and the greatest surge in information technology since the printing press. These materials shaped the development of so ciety and helped determine which countries dominated geopolitics.





If graphene had merely one of its many superlative traits, it would be the subject of intense research into potential uses. Being so remarka ble in so many ways, graphene has inspired scientists to think of a wi de range of uses for the material, in fields as varied as consumer tec h and environmental science.

FLEXIBLE ELECTRONICS

In addition to its powerful electrical properties, graphene is also high ly flexible and transparent. This makes it attractive for use in portable electronics. Smartphones and tablets could become much more durable using graphene, and perhaps could even be folded up like paper. Wearable electronic devices have been growing in popularity recently. With graphene, these devices could be made even more useful, designed to fit snugly around limbs and bending to accommodate various forms of exercise.

Graphene's flexibility and microscopic width provide opportunities be yond mere consumer devices, however. It could also be useful in biom edical research. Small machines and sensors could be made with grap hene, capable of moving easily and harmlessly through the human bo dy, analyzing tissue or even delivering drugs to specific areas. Carbon is already a crucial ingredient in the human body; a little graphene ad ded in might not hurt.



SOLAR POWER GENERATION

Graphene is both highly conductive and transparent. As such, it has g reat potential as a material in solar cells. Typically, solar cells use silic on, which produces a charge when a photon hits the materials, knocking loose a free electron. Silicon only releases one electron per photon that hits it. Research has indicated that graphene can release multiple electrons for each photon that hits it. As such, graphene could be far better at converting solar energy.

Before long, cheaper, more powerful graphene cells could produce a massive surge in renewable energy. Graphene's photovoltaic properti es also mean that it could be used to develop better image sensors for devices such as cameras.



SEMICONDUCTORS

Due to its high conductivity, graphene could be used in semiconducto rs to greatly increase the speed at which information travels. Recently the Department of Energy conducted tests that demonstrated that semi-conductive polymers conduct electricity much faster when place d atop a layer of graphene than a layer of silicon. This holds true even if the polymer is thicker. A polymer 50-nanometers thick, when place d on top of a graphene layer, conducted a charge better than a 10-nanometer layer of the polymer. This flew in the face of previous wis dom which held that the thinner a polymer is, the better it can conduct charge.

The biggest obstacle to graphene's use in electronics is its lack of a b and gap, the gap between valence and conduction bands in a materia I that, when crossed, allows for a flow of electrical current. The band gap is what allows semi-conductive materials such as silicon to function as transistors; they can switch between insulating or conducting a n electric current, depending on whether their electrons are pushed across the band gap or not.

Researchers have been testing a variety of methods to give graphene a band gap; if successful, that could lead to much faster electronics built with graphene.



WATER CLEANSING

Graphene's tight atomic bonds make it impermeable for nearly all gas ses and liquids. Curiously, water molecules are an exception. Because water can evaporate through graphene while most other gasses and I iquids cannot, graphene could be an exceptional tool for filtration. R esearchers at the University of Manchester tested graphene's permea bility with alcohol and were able to distill very strong samples of spirits, as only the water in the samples was able to pass through the graphene.

Of course, graphene's use as a filter has potential beyond distilling st ronger spirits. Graphene could also be immensely helpful in purifying water of toxins. In a study published by The Royal Society of Chemistr y, researchers showed that oxidized graphene could even pull in radi oactive materials such as uranium and plutonium present in water, lea ving the liquid free of contaminants. The implications of this study ar e massive. Some of the biggest environmental hazards in history, including nuclear waste and chemical runoff, could be cleansed from wat er sources thanks to graphene.



WATER CLEANSING

As overpopulation continues to be one of the world's most pressing e nvironmental concerns, maintaining clean water supplies will only bec ome more important. Indeed, water scarcity afflicts more than a billio n people worldwide, a number that will only continue to rise given cu rrent trends. Graphene filters have immense potential to improve wat er purification, increasing the amount of fresh water available. In fac t, Lockheed Martin recently developed a graphene filter called "Perfo rene," which the company claims could revolutionize the desalination process.

Current desalination plants use a method called reverse osmosis to fil ter salt out of seawater. Reverse osmosis uses pressure to move water through a membrane. In order to produce large amounts of drinkable water, the pressure involved requires enormous amounts of energy. A Lockheed Martin engineer claims their Perforene filters could reduce the energy requirements a hundred times less than that of other filters.



SUPERCONDUCTIVITY

Not long after scientists at Cambridge demonstrated that graphene c an act as a superconductor (a material with no electrical resistance) when paired with praseodymium cerium copper oxide, researchers at MIT discovered another astounding property: It can apparently functi on as a superconductor alone, in the right configuration. The researchers stacked two slices of graphene, but offset them by an angle of 1.1 degrees.

According to a report published in Nature, "Physicist Pablo Jarillo-Her rero at the Massachusetts Institute of Technology (MIT) in Cambridge and his team weren't looking for superconductivity when they set up their experiment. Instead, they were exploring how the orientation dubbed the magic angle might affect graphene."

What they discovered is that, when they ran electricity through the off-kilter graphene stack, it functioned as a superconductor. This simp le process of applying electricity makes graphene easier to study than a similar class of superconductors, cuprates, although those materials display superconductivity at much higher temperatures. Most materials that display superconductivity only do so near a temperature of a bsolute zero. Some so-called "high-temperature superconductors" can display superconductivity at temperatures around 133 Kelvin (-140 Celsius), which is relatively high; hydrogen sulfide, under enough pressure, displays the property at a miraculous -70 degrees Celsius!



SUPERCONDUCTIVITY

The graphene arrangement had to be cooled to 1.7 degrees above ab solute zero, however, the researchers consider its behavior similar to that of cuprates, and so they hope that it will be a much easier mater ial for studying unconventional superconductivity, which is still an are a of great disagreement among physicists.

Because superconductivity typically only happens at such low tempera tures, superconductors are only used in costly machinery like MRI mac hines, but scientists hope to one day find a superconductor that work s at room temperature, which would bring down costs by removing th e need for cooling units.

In a study published in 2019, researchers showed how twisting layers of graphene at specific "magic" angles can produce superconductive properties at lower temperatures than before.



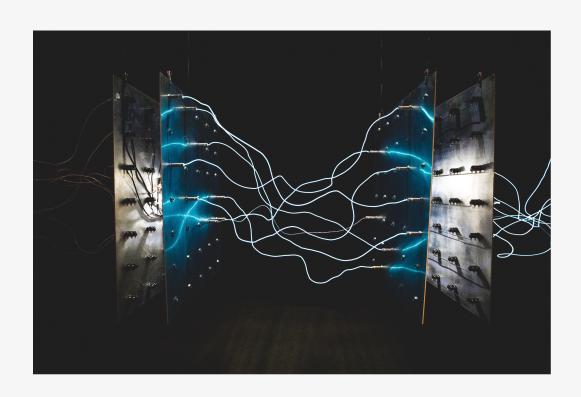
THE FUTURE OF GRAPHENE

Given graphene's seemingly endless list of strengths, one would expect to see it everywhere. Why, then, has graphene not been widely ad opted? As with most things, it comes down to money. Graphene is still extremely expensive to produce in large quantities, limiting its use in any product that would demand mass production. Moreover, when large sheets of graphene are produced, there is an increased risk of tiny fissures and other flaws appearing in the material. No matter how incredible a scientific discovery may be, economics will always decide success.

Production issues aside, graphene research is by no means slowing do wn. Research laboratories the world over — including the University of Manchester, where graphene was first discovered — are continuall y filing patents for new methods of creating and using graphene. The European Union approved funding for a flagship program in 2013, on e that will fund graphene research for use in electronics. Meanwhile, major tech companies in Asia are conducting research on graphene, i ncluding Samsung.

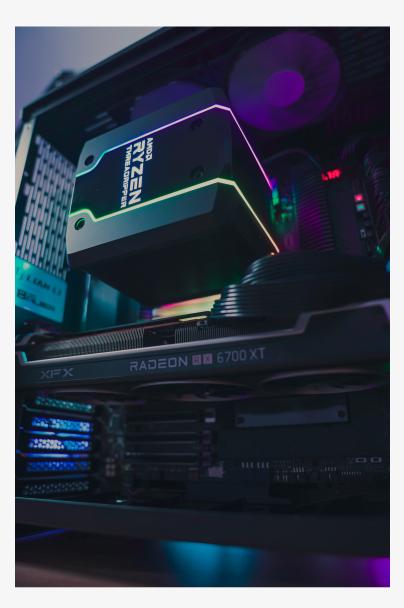
Revolutions don't happen overnight. Silicon was discovered in the mid-19th century, but it took nearly a century before silicon semiconductors paved the way for the rise of computers. Might graphene, with its almost mythical qualities, be the resource that drives the next era of human history? Only time will tell.





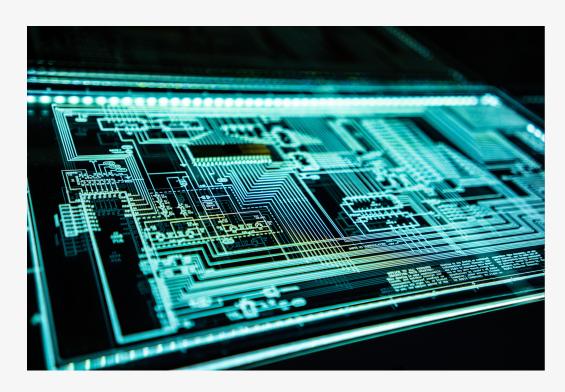






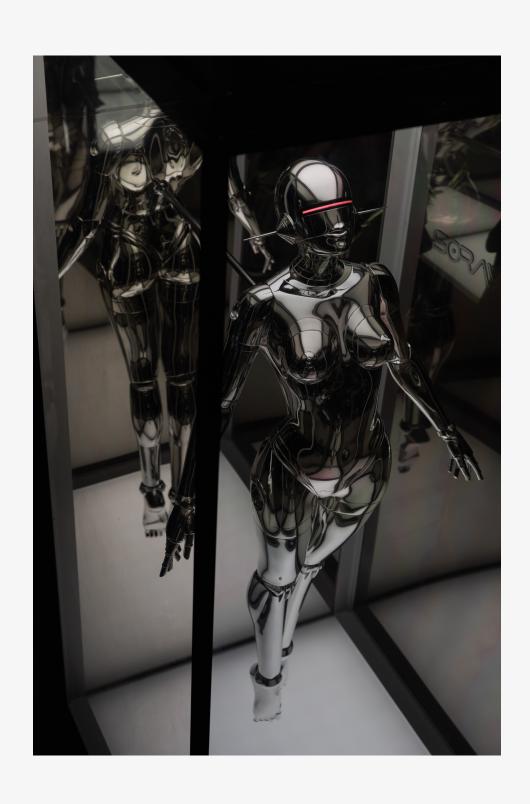














TAKE THE LEAD OF GRAPHENE-BASED MANUFACTURING INDUSTRY



TRANSPORT, MEDICINE, ELECTRONICS, ENERGY, DEFENSE, DESALINATION -

THE RANGE OF INDUSTRIES WHERE GRAPHENE IS MAKING AN IMPACT IS SUBSTANTIAL.

This is only the start. These are only the first steps.

The potential of graphene is limited only by our imagination.

BIOMEDICAL



Graphene's unique properties allow for ground-breaking biomedical applications. Targeted drug delivery; improved brain penetration; DIY health-testing kits and 'smart' implants.

MEDICAL SCIENCE

Graphene based materials including pristine graphene sheets, few-la yer graphene flakes, and graphene oxide offer a variety of unique, ve rsatile and tunable properties that can be creatively utilised for biom edical applications.

DRUG DELIVERY

The lateral dimensions of these two dimensional (2D) materials can be adjusted between nanometres and millimetres, their thickness can be tuned from single to hundreds of monolayers, and their flexural rigidity can also be modulated. The flat surface can be easily functionalize denabling modification of the surface property (from hydrophobicity to hydrophilicity). This is unprecedented among other nanomaterials, offering enormous design capabilities as a platform for drug delivery and ultrasensitive biosensors.

BIOMEDICAL APPLICATIONS

Graphene applications in biomedicine are numerous and can be classi fied into several main areas: transport (delivery) systems, sensors, tiss ue engineering and biological agents (for example antimicrobials).

GRAPHENE MEDICAL DEVICES

At the University we are investigating all the potential and promising properties of graphene and 2D materials for developing innovative a nd revolutionary medical devices that could improve healthcare.



GRAPHENE-BASED COMPOSITE MATERIALS

Graphene is a material with a huge amount of outstanding qualities; s trength, flexibility, lightweight and conductivity. One of the simplest and most effective ways of harnessing the potential of graphene is to combine it with existing products – so called composite materials. The impact of graphene-based composites is set to reverberate throug hout countless industries, enhancing performance and increasing application possibilities. The University has developed a critical mass of researchers who are working across a huge variety of specialist areas a nd collaborating with commercial partners to unlock the benefits of graphene composites in different guises.

RUST-FREE FUTURE

Researchers at The University of Manchester have already shown the potential of a rust-free future. By combining graphene with paint, a unique graphene coating is formed which could signal the end of the deterioration of ships and cars through rust.



GRAPHENE-BASED COMPOSITE MATERIALS

WEATHERPROOFING AND PACKAGING

The same technique could also be applied to brick and stone, to weat herproof houses, or even to food packaging to stop the transfer of w ater and oxygen molecules which causes food to go off. Further bene fits come from incorporating graphene-based composites in major co mponents in industries such as construction, transport or aerospace. Due to ongoing research alongside commercial collaborators, scientist s at The University of Manchester are moving toward a realistic futur e where potential is becoming reality.

GRAPHENE FOR SPORT

Sporting goods are often the first to take up on new materials devel opment which has already been the case with the successful graphen e-enhanced tennis racket from Head. Graphene-based composites an d coatings could be further involved in enhancing sports equipment in n skiing, cycling, and even Formula 1 in the near future.

LIGHTEST, STRONGEST, SAFEST, GREENEST

A graphene-based composite aircraft wing could drastically decrease weight, reduce the detrimental effects of lightning strike damage and increase fuel efficiency and range. This could result in the world's lightest, strongest, safest, greenest plane.

ELECTRONICS



Graphene has the potential to create the next-generation of electronics currently limited to sci-fi. Faster transistors; semiconductors; ben dable phones and other electronics.

GRAPHENE ELECTRONICS

Graphene can be used as a coating to improve current touch screens for phones and tablets. It can also be used to make the circuitry for o ur computers, making them incredibly fast. These are just two examples of how graphene can enhance today's devices. Graphene can also spark the next-generation of electronics.

WEARABLE TECHNOLOGY

Graphene could see a smart phone which you could wear on your wrist or a tablet you could roll up like a newspaper. Flexible, wearable electronics take advantage of graphene's mechanical properties as well as its conductivity. Indium—tin oxide is currently used for touch screens as it conducts well but it is brittle.

ELECTRONICS



GRAPHENE TRANSISTORS

Researchers at The University of Manchester have already created the world's smallest transistor using graphene. The smaller the size of the transistor, the better they perform within circuits. The fundamental challenge facing the electronics industry in the next 20 years is the further miniaturisation of technology.

GRAPHENE SEMICONDUCTORS

Graphene's unique properties of thinness and conductivity have led to global research into its applications as a semiconductor. At just one atom thick and with the ability to conduct electricity at room temper ature, graphene semiconductors could replace existing technology for computer chips. Research has already shown that graphene chips are much faster than existing ones made from silicon.

ENERGY



Imagine fully charging a smartphone in seconds, or an electric car in minutes. That's the power of graphene.

GRAPHENE IN BATTERIES

Graphene could dramatically increase the lifespan of a traditional lith ium ion battery, meaning devices can be charged quicker – and hold more power for longer. Batteries could be so flexible and light that they could be stitched into clothing. Or into the body. For soldiers, who carry up to 16lbs of battery at one time, the impact of this could be huge. Carrying less weight, and using batteries that can be recharged by body heat or the sun would allow them to stay out in the field for longer.

GRAPHENE SUPERCAPACITORS

Graphene supercapacitors could provide massive amounts of power w hile using much less energy than conventional devices. Because they are light, they could also reduce the weight of cars or planes.

STORING WIND AND SOLAR POWER

At The University of Manchester we're also investigating graphene's potential in grid applications and storing wind or solar power with our growing number of commercial partners.



GRAPHENE MEMBRANES

Imagine clean drinking water for millions in developing countries. The development of graphene-based membranes at The University of Manchester brings that possibility closer.

GRAPHENE FILTRATION

Graphene oxide membranes are capable of forming a perfect barrier when dealing with liquids and gasses. They can effectively separate o rganic solvent from water and remove water from a gas mixture to an exceptional level. They have even been proved to stop helium, the h ardest gas to block.

POTENTIAL APPLICATIONS

The simplicity of the technique and the sophistication of the membra nes developed at The University of Manchester means the scope for p otential applications is widening quickly, while each day of research b rings with it new ideas. We are currently looking at how graphene me mbranes can be used for water filtration, gas separation and desalina tion projects.

GRAPHENE COATINGS

A single layer of atoms that can act as a perfect barrier has the pote ntial to open up vast new markets and revolutionise countless industrial processes. Using graphene coatings on food and pharmaceutical packaging can stop the transfer of water and oxygen, keeping food and perishable goods fresher for longer. The removal of harmful carbon dioxide released into the atmosphere by power stations is not currently done on any scale, graphene membranes could change that.

SENSORS



Graphene detects. Ultra-sensitive sensors made from graphene could detect minute dangerous particles helping to protect potentially dan gerous environments.

GRAPHENE SENSORS

Graphene is an ideal material for sensors. Every atom in graphene is exposed to its environment allowing it to sense changes in its surrou ndings. For chemical sensors, the goal is to be able to detect just one molecule of a potentially dangerous substance. Graphene now allows for the creation of micrometre-size sensors capable of detecting individual events on a molecular level.

REDUCING FOOD WASTE

Graphene oxide can be used to create 'smart' food packaging produc ts. This could dramatically cut down on unnecessary food wastage an d simultaneously help prevent illnesses. Packaging which has been co ated with graphene has the ability to detect atmospheric changes ca used by decaying food.

CROP PROTECTION

Graphene sensors could boost the effectiveness of monitoring vital crops in the agriculture industry. Farmers would be able to monitor the existence of any harmful gasses which could impact upon crop fields and take relevant action. As graphene sensors are so sensitive it is fe asible that they could determine the ideal areas for growing certain crops depending on atmospheric conditions.

BIOTECHNOLOGY



Graphene and its derivatives possess some intriguing properties, which generates tremendous interests in various fields, including biomedicalerine. The biomedical applications of graphene-based nanomaterials have attracted great interests over the last decade, and several groups have started working on this field around the globe. Because of the excellent biocompatibility, solubility and selectivity, graphene and its derivatives have shown great potential as biosensing and bio-imaging materials.

GRAPHENE IN BIOMEDICAL APPLICATIONS

Molecules, biomolecules, quantum dots, polymers, and even nanoparticles could be loaded/conjugated onto graphene-based carriers. The loading could be achieved via covalent bonding or non-covalent interactions; e.g., hydrogen bonding, hydrophobic, $\pi - \pi$ stacking, and electrostatic interactions.

GRAPHENE OXIDE IN DRUG AND GENE DELIVERY

Graphene and its derivatives are the latest materials to be designed f or drug and gene delivery applications, including targeted delivery. T he ability to load both water-soluble and insoluble active compounds, and attach different targeting moieties onto graphene oxide (GO) pla telets could enable their use in targeted or non-targeted drug and g ene delivery applications.





GRAPHENE FILMS AND GRAPHENE OXIDE IN TISSUE ENGINEERING

Tissue engineering relies on the design of biocompatible scaffolds with suitable physical, chemical, and mechanical properties. Graphene and its derivatives are of interest as scaffold materials due to their inherent elasticity, flexibility, high surface area, adaptability, and function ality. GO and rGO, in the form of thin films, were shown to be appropriate scaffolds for the growth of mammalian fibroblast cells since the y display good biocompatibility as a surface coating material, without inducing notable detrimental effects while enhancing some cellular functions such as gene transfection and expression.

GRAPHENE IN BIOSENSORS, BIOELECTRONICS

Graphene's unique electrochemical properties include a wide electrochemical window, low-charge transfer resistance, well-defined redox peaks, and rapid electron transfer kinetics. As a result, graphene could be very suitable as an electrode material in electrochemical biosens ors. Another important feature required in optical biosensors is their ability to be functionalized. As previously mentioned, graphene and e specially GO are very versatile materials for further functionalization.



FASHION AND SMART CLOTHING

Graphene has proved to be a game-changer in wearable technology. As a result, many athletic companies and clothing brands recently star ted to work with graphene suppliers to produce graphene fabrics. Graphene fabrics can make sportswear and winter clothing such as a graphene jacket, a battery heated jacket, gloves, trousers, basics like shirts and socks, and various other winter garments.

It is because graphene is an excellent thermal conductor due to its he at-preserving properties. Graphene fibre in the textile industry has g ained popularity because its thermal properties revolutionize clothin g. Graphene fiber acts as a filter between the environment and your skin. It expels heat in warm surroundings but preserves the heat in c old weather by evenly distributing body heat. Thus, it is perfect for all seasons. This is how graphene-enhanced fabrics naturally reinforce body temperature adjustment. These fabrics are also very comfortable and lightweight.



BUILD OUR NETWORK

SHAPE ACTUAL NETWORK

We have a long experience in this industry so we can start networkin g. First step is to develop a roadmap after we identify the needs of o ur goal. To achieve this goal, we will create milestones by prioritizing the needs of our network members. And we will develop attractive so lution to appeal new companies and engineers to join.

MOBILE PLATFORM

The sole reason apps are receiving such astounding success is that th ey're convenient to use and give users a chance to engage more with our services. For anyone who needs network in engineering field we need fast and easy application for our platform. Once consumers use our services and are satisfied with the same, they're bound to use th em regularly. Users just want access to good apps with the required f eatures. Once our app offers them the same, any potential user can be converted into a loyal one. Furthermore, our app can generate new users with Word of Mouth publicity and digital marketing techniques.



BUILD OUR NETWORK

CREATE BRAND AWARENESS

We will offer a personalized user experience for our clients and user s. If they have special deals or sales for your top-rated customers, we can offer them a personalized feel about your services. Apart from th is, we will utilize mobile app to get into a consumer's life, and so it be ecomes the go-to thing for a customer. Therefore this solution completes the brand experience that we're trying to provide. Building strong engineering network in first step, then we can expand it to common users to raise our brand reputation.

EXHIBITON & EVENT

Our customers and app users will have information about global exhibition and event. They can also participate in world exhibition throug h our business platform. Regarding these activities, we will raise fund and fee by FGN token 24/7 worldwide.



























CREATE WORK FORCE WITH GLOBAL SPECIALISTS' NETWORK



PROFESSIONAL & HIGHLY EXPERIENCED

OUR LEADERSHIP & RESPONSIBILITY

Our leaders are dedicated to serving the people who make something happen. In collaboration with our co-workers and experts in the worl d, we seek to constantly improve the value of our service.

By deeply studying the goals and interests, we keep it passionately engaged on our projects. Through the cultivation of talent and potential, we develop our value and find opportunity to offer.

BETTER PERFORMANCE BY TEAMWORK

Everyone says it, but in our case it's true. Our team is the secret to o ur success. Each of our members is amazing in their own right, but to gether they are what makes this project such a rewarding place to work.

We are a tight-knit, talented group with a shared vision of delivering consistently great results for our clients, as well as ensuring the agen cy is a inclusive, challenging place to work and develop a rewarding o utput to share.



PROFESSIONAL & HIGHLY EXPERIENCED

LONG & PROFESSIONAL EXPERIENCE

We have a long experience in this industry and numerous global netw orks. Most of the members have at least a master's degree in materia I, architecture, biotechnology, IT technology, and computer science, a nd have a strong network through their long career in the field and business.

On this basis, our project will be able to bear fruit successfully.



FGN TOKEN

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TOKEN CATEGORIES	KEY FEATURES
PAYMENT	PAYMENT
TOKEN SPECIFICATIONS	DETAILS
TECHNOLOGY	TRON BLOCKCHAIN
STANDARD	TRC-20
SYMBOL	FGN
REDEMPTION RIGHTS	NO

MARKETING	25%
R&D	15%
GLOBAL	15%
FOUNDERS	5%
RESERVES	30%
PARTNERS	10%



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