The fight against climate change is on. Humanity is mobilizing.

RENEUM LITEPAPER

JULY 2022
Reneum is a blockchain-based marketplace for individuals with a cause, companies with a purpose and renewable energy projects around the world that need funding to make the overdue energy transition possible.

The aim of the Reneum marketplace is simple: to finally offer a meaningful solution for individuals and companies to participate in, and support, the energy transition.

So how do we do it? For every megawatt-hour of renewable energy produced by a certified supplier on the Reneum marketplace, the Reneum treasury will mint a RENW token, representing the environmental benefit of the production of clean energy. This can be likened to the tradable environmental commodity known as a Renewable Energy Certificate (REC) in legacy environmental markets.

These MWh-backed tokens can then be bought and retired through the Reneum marketplace in exchange for a green receipt in the form of an “Eisbaer” NFT. This NFT represents what is known as a retired REC in environmental markets; a green certificate that proves that you are the exclusive holder of the positive environmental attributes of the MWh. Its purpose is to evidence that your funds have been sent directly to the renewable energy producer to help them fund their development and expansion.

Within 24 months of the initial token launch, Reneum intends to be fully DAO-governed and to then diversify into other types of environmental projects that support net-zero targets. The Eisbaer NFT, which features digital art and metadata, gives holders access to our community of changemakers. Community participants will benefit from voting rights on commercial activities and the selection of projects to be funded.

The energy transition is pivotal in the global fight against climate change, yet millions of people feel powerless to do anything about it. Reneum is a solution for the hopeful; leveraging blockchain technology to help everyone take direct climate action, for a change.
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THE PROBLEMS

CLIMATE CHANGE

Today we are witnessing the effects of climate change ubiquitously across the globe. Melting ice sheets resulting in higher sea levels, increased acidity in the oceans that chokes marine life, and volatile, historically unprecedented weather patterns. We have observed a marked increase in wildfires and flash-flooding, the disintegration of natural habitats, the extinction of millions of species and the destruction of coral reefs. The long-term effects of climate change are complex and difficult to model, but the likelihood of an impending mass migration due to inhospitable territories is reaching consensus. Scientists have been warning us for years that extreme weather is going to get more extreme; we’re living it now in real time.

Many of these climate events are a direct result of increased CO₂ in our atmosphere, which is in turn a direct result of human activity, including an outsized contribution of carbon emissions from the burning fossil fuels.

The evidence to support these facts is now irrefutable and the urgent need to act is generally accepted. The technology exists and so do the resources we need to achieve it. But it is simply not happening.

WHEN WILL IT BECOME TOO LATE?

According to the latest Intergovernmental Panel on Climate Change (IPCC) report published in April 2022:

“Even if the world rapidly decarbonizes, greenhouse gases already in the atmosphere and current emissions trends will make some very significant climate impacts unavoidable through 2040. The IPCC estimates that in the next decade alone, climate change will drive 32-132 million more people into extreme poverty. Global warming will jeopardize food security, as well as increase the incidence of heat-related mortality, heart disease and mental health challenges.”

We must act now.
The last two jarring IPCC reports[^1] have issued what UN Secretary-General António Guterres described as a "code red for humanity"[^5]. Reports like these have highlighted just how important it is to cull the burning of fossil fuels — the chief driver of the climate crisis — immediately, and transition into a sustainably-powered world. To reach the net-zero emissions targets set forth in the UN’s famous Paris Agreement[^6], annual clean energy investment needs to increase seven-fold; from less than $150 billion in 2020 to more than $1 trillion per year by 2030.

Despite science mapping a clear path to climate health, many markets are still far from turning off the taps of fossil fuel funding. To many, the world’s increased dependency on fossil fuels indicates grandiose inaction — leading to an internationally-experienced sense of betrayal from political and corporate leaders.

Aside from the fact that fossil fuels are causing climate change, they are also finite and quickly running out. At current rates of consumption, oil and natural gas are projected to be exhausted within a half century. As supply becomes increasingly scarce, it is both environmentally and financially unsustainable to rely on fossil fuels.

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[^6]: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
In summary: the global economic system is rigged to discourage companies and governments from changing course. But we know we cannot wait, or it’ll be too late. At Reneum, we have identified RECs as a meaningful instrument to drive the change needed to power the energy transition, from the bottom up, giving everyone the change to take #DirectClimateAction.

THE FAILURE OF RENEWABLE ENERGY MARKETS

Why do we continue to mine, explore and extract fossil fuels that poison our communities in spite of the existence of a viable alternative? The problem is a coordination one - which ultimately, boils down to money.

Currently only 16% of global electricity comes from renewables, but we need to raise that to at least 80% by 2050 to reach net-zero targets. The challenge is: renewable energy projects are still financially handicapped compared to their fossil fuel counterparts; high upfront capital investments, further complicated by regulation that still heavily favors fossil fuels, with subsidies to fossil fuels allocated at a rate of 10:1 to those of renewables. In aggregate, the returns profile of fossil fuels still eclipses those of renewables in most markets, a combination that leads to a sadly potent cocktail against decisive environmental action. Due to a structural failure known as the multi-polar trap, for-profit companies playing by the commercial rules of shareholder capitalism are still incentivized to double down on fossil fuels.
RENEWABLE ENERGY CERTIFICATES (RECs)

Chief among the most accepted solutions to the climate finance challenge is the acceleration of environmental markets. Based on the principles of market-based capital redistribution from polluting enterprises and activist individuals to worthy climate causes, environmental markets were an attempt to price in environmental externalities. Tradeable commodities like Renewable Energy Certificates (RECs) act as additional revenue streams for producers, powering change. They can help existing developers with operating cashflows, help them to become cost-competitive with their fossil fuel counterparts, or help secure additional capital pre-construction, making them a materially significant instrument to accelerate the energy transition.

While theoretically viable, traditional REC markets, traded over-the-counter between multiple layers of rent-seeking intermediaries, have systematically failed in their promise. Similar to their cousin, the carbon offset, RECs are purchased by companies and individuals to neutralize their electricity footprint or offset for their emissions sins.

Also, like offsets, RECs are built on anachronistic models: analogue, centralized, and no longer fit for purpose. Structural limitations like arbitrary geographic restrictions, opaque trading registries, fragmented yet bureaucratic issuers, and a lack of standards interoperability have prevented ubiquitous adoption.

Constraints limiting the scalability of legacy REC markets include the following outcomes:

- A high degree of centralization and bureaucracy
- Inaccessible to many project owners, particularly in emerging markets most heavily impacted
- Anachronistic user-interfaces leading to inefficient settlements and trading experience
- Protracted contract negotiations due to the presence of multiple intermediaries that limit liquidity
- Rent-seeking intermediaries and brokers withholding financial benefits from projects in need
- Non-interoperable, siloed registries, resulting in market abuse, fraud, and double-dipping
Instead of channeling capital to the renewable energy producers, these ecosystem flaws have resulted in a sluggish, inaccessible and illiquid REC market that is not fit for purpose. We need a global mechanism with integrity to democratize access, accelerate renewable energy deployment and redistribute finance to finally align incentives with objectives.

Now time is fast running out. Our carbon budget is running out. And all this despite overwhelming public support for the fight against climate change.
Renewable energy, by definition, does not run out. Thanks to technological innovation and dematerialization principles like Moore’s Law, development costs continue to fall along with the environmental damage caused. And as supporting technologies like battery storage becomes increasingly sophisticated, a world powered by renewable energy sources like wind and solar becomes realistically viable.

In auditing potential solutions to drive a wall of money to the developers on the ground, Reneum concluded that a buoyant and trusted REC market was the fastest option. Designed with integrity, it can unleash the potential of emerging markets, where capital is skittish and producers are struggling.

So, we went back to first principles and designed a new model from scratch. Reneum is based on the concepts of the traditional environmental markets, but leverages decentralized ledger technologies (blockchain) to transcend the limitations of RECs for an entirely Web3-native re-conception of value. Unlike other environmental instruments on the blockchain which operate from a skeuomorphic vision – simply layering analogue products on top of digital infrastructure – Reneum issues the first digitally native, vertically-integrated renewable token that enables unrestricted access to renewable energy.

Reneum is a return to earnest value creation in these markets to create a global, decentralized, democratized market. The distinction is unmistakable; blockchain technology allows for a complete evolution beyond the inefficient legacy markets, for a solution that actually drives the energy transition.
2.0

BLOCKCHAIN TECHNOLOGY

Here’s the thing: environmental markets have been around for decades, and they’re still not working. Centralized databases, infused with their related bureaucratic processes and non-interoperable nature, have stifled adoption and led to bottlenecks at scale.

From a user perspective, there are minimal differences between using a traditional centralized registry and a blockchain-based platform, but the data management and reporting potential with blockchain opens up a world of benefits previously unimaginable via centralized registries.

Reneum’s thesis is that the features characteristic of blockchain technology offer seamless solutions required to upgrade the antiquated REC system, for the first financially instrumental market.

<table>
<thead>
<tr>
<th>Problem: Antiquated REC System</th>
<th>Solution: Blockchain Technology</th>
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<tbody>
<tr>
<td>Centralized and bureaucratic with middlemen causing inefficiency</td>
<td>Decentralized automated technology that connects two parties efficiently</td>
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<tr>
<td>Lack of transparency increases risk of corruption</td>
<td>Transparent public records that can be verified by anyone</td>
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<tr>
<td>Prone to error and reliant on trust of human actors</td>
<td>Completely trustless automated network of smart contracts</td>
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<tr>
<td>Risk-adjusted financing costs higher where investment is needed most</td>
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<td>Slow and cumbersome with structural limitations</td>
<td>Instantaneous, removing barriers, making it quicker and cheaper</td>
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<tr>
<td>Fragmented, insecure and riddled with fraud</td>
<td>Immutable and incorruptible with security and cryptography baked in</td>
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<tr>
<td>Regulatory compliance and financial barriers to entry</td>
<td>Open to everyone throughout the world at minimal cost</td>
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A decentralized financial system will be incorruptible, transparent and immutable. It is also accessible and verifiable to anyone with internet access, promoting unparalleled transparency and trust. The use of open-source smart contracts reduces the need for time-consuming and costly human intervention.

**BLOCKCHAIN ADOPTION**

According to a Wells Fargo report published in February 2022, the progress of blockchain adoption is comparable to internet uptake in the late 1990s, making blockchain’s utility similar to the pre-Google era. Billions of dollars’ worth of Bitcoin alone are currently held on corporate balance sheets, and even by countries, demonstrating its ascending institutional acceptance. NFTs are an even more novel Web3 innovation, whose adoption we are only scratching the surface of. NFTs are both digital property and digital certification, with applications in areas such as ownership, certification and identity.

**EMERGING MARKETS & BLOCKCHAIN**

While the adoption of digital assets in the developed world is mainly through institutional investment, usage in developing economies is far more practically applied, where they have a direct and meaningful effect on the poorest families and communities. The economic necessity to store and transfer wealth in countries where runaway inflation is rampant, becomes a matter of survival. Hence, it’s unsurprising that only about 8% of people in the US own or have used a digital asset, while 32% of people in Nigeria can say the same.

Blockchain technology allows the poorest unbanked to become banked and able to hold digital assets with their self-custody wallets. Blockchain is a powerful tool for good, impacting the real life of the poorest families in the developing world, most of whom are excluded from the existing financial system.

For this reason, a blockchain-based marketplace is the best possible tool for directing capital to the poorest among us, for the benefit of us all.

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*Wells Fargo report*
WEB 3.0

The now colloquially-known, ‘Web3’, referring to all blockchain-based products including cryptocurrencies like Bitcoin, NFTs, and new decentralized technologies infrastructure, is the future of the internet. Web 3.0 is a decentralized internet in which its users and contributors are the owners. Aside from the technological aspect, which is still in its infancy, it also describes a new mentality. This is characterized primarily by proactivity, self-reliance and personal agency, and includes direct participation in the creation, operation and governance of decentralized protocols. Web3 has become a catch-all term for the vision of a new, safer, more equally-distributed internet.

Web 3.0 is defined by:

• Decentralization: instead of the benefit of the internet being concentrated in the hands of a few commercial organizations, ownership is distributed amongst its builders and users

• Permissionless: equal access to participate in, and contribute to, Web3

• Native Payments: leveraging the philosophy of a token economy, native currencies and rewards are distributed to participants to facilitate engagement and payments

• Trustless: operating using economic (rational) incentives based on game theoretic principles rather than relying on trusted third-parties

In contrast to previous phases of the internet, when the big winners were mostly founders and venture capitalists, Web 3.0 is open for everyone to benefit. It is therefore a crucial instrument in the battle against wealth inequality and common good challenges like those addressed by Reneum, starting with the fight against climate change.

RENEUM LITEPAPER
THE RENEUM MARKETPLACE

Climate change is the biggest problem of our generation. Blockchain is the most important technological innovation of our times. The Reneum marketplace seeks to solve the former by applying the latter. This will be achieved by driving capital to renewable energy producers, thanks to millions of ordinary people being able to take direct climate action, for a change.

The Reneum marketplace will utilize blockchain technology on the Polygon network, one of the greenest and most energy-light blockchains. Using this network, Reneum aims to circumvent the consequences of traditional systems, allowing everyone — billions of individuals, families, households and companies — to take direct action on climate change, bypassing the bureaucracy, inaction and ineffectiveness of the current legacy system. We are evolving from an outdated system that is overdue for a facelift. It’s about utilizing the best technological tools at our disposal to power the energy transition.

The Reneum marketplace will be accessible to anyone, establishing itself as the most inclusive network of its kind. Renewable energy projects participating in the ecosystem will be monitored in real-time, audited and certified using internationally-recognized, best-practice methodology. These processes will ultimately be fully automated, and all non-sensitive data will be instantaneously and publicly visible to everyone.

The more the Reneum marketplace grows, the more liquidity gets funneled into our ecosystem. As more people join our community, more capital can be directly streamed into the green projects we need up and running to expedite the energy transition.
HOW WE’LL DO IT

Once a project is certified on the Reneum marketplace, every MWh of renewable energy it supplies to the electricity grid will be automatically measured and represented by RENW fungible tokens, the equivalent of ‘live’ RECs in environmental markets. These RENW tokens can then be bought by anyone and retired to mint an Eisbaer NFT artwork. For every Eisbaer NFT minted, the renewable energy project is directly credited, receiving the entire value of the purchase minus Reneum’s platform fee of 10%.

Reneum will become the de facto green marketplace to drive funding to approved renewable energy projects around the world. But renewable energy will just be the beginning. As our credibility and contribution expands, we intend to use the marketplace as a funding vehicle for other environmental causes. Our community will help us identify the most worthy and impactful causes for true decentralization of impact.

CERTIFICATION & GOVERNANCE

To break down existing barriers and avail the marketplace to all worthwhile projects, Reneum will operate an impartial and automated certification process. Reneum abides by industry best practices for its certification requirements, including measurable requisites per its published Certification Methodology. Once approved, Reneum does spot audits of generation data by reconciling meter readings with Reneum’s accrued inventory to ensure projects are credited for the precise MWh generated. The entire audit trail is then affixed to the NFT metadata in a unique memo, to create assets in the public ledger with unparalleled data integrity.

Reneum endeavors to make this process fully automated with the use of smart contracts and oracles such as satellite imagery and third-party meters.
EISBAER NFTs

Holding an Eisbaer NFT is a public statement of support for our human family across the globe and their struggle to fight climate change. They represent the exact contribution made by the buyer to the energy transition.

Each Eisbaer has unique properties pertaining to a specific renewable project invested in, along with the environmental impact to demonstrate contribution. Think Fair Trade or LEED-certified for the green movement.

Similar to baseball cards, they reveal all the unique characteristics about the underlying projects, along with the nominal value of MWh purchased so holders can proudly bear their contribution. The more the MWh purchased, the greater impact to the underlying project, and therefore, the energy transition.

The Reneum Discord community is now open to anyone who wants to be part of the conversation. As we continue raising awareness of our mission, it will include thought leaders, those at the forefront of science and technology, business and academia.

The Discord community will serve as an engine for activity, discourse and open debate on the climate revolution, a place to organize ourselves among an extensive network of people and resources.

Crucially, it will eventually serve as the starting point for creating a polling station for Reneum policies and the appropriation of funds.
THE VALUE

TO RENEWABLE ENERGY & THE ENVIRONMENT

Reneum creates a free and fluid marketplace that helps drive capital to environmental projects in places where historically it has been hardest to reach, boosting renewable energy production, pushing fossil-fuel energy out of the market and thus reducing carbon emissions to counteract global warming.

As a consequence, Reneum will become the global go-to trusted marketplace for environmental financial tokens to drive funding to projects that need it most. Renewable energy projects will be the first suite of tokens available via the marketplace but as our reputation and exposure grows it is hoped that the infrastructure will be used for other types of environmental projects such as those concerned with energy efficiency, the oceans, plastics and deforestation.

As a not-for-profit, Reneum issues tokens to producers of renewable energy, providing a direct resource to renewable energy owners and accelerating the energy transition.

TO THE IMAGE OF BLOCKCHAIN

The primary environmental issue surrounding cryptocurrencies and blockchain is the fossil fuel-powered electricity used to mine new tokens. This challenge is precisely what the Reneum instrument addresses. Reneum is designed as a direct solution for Cryptocorporates who are concerned about the energy impact related to mining. Being a blockchain-native company ourselves, Reneum offers a solution that is seamless and interoperable with their own infrastructure.

TO THE PEOPLE

The apathy and powerlessness felt by people around the world to influence the energy transition may be the single greatest obstacle in the fight against global warming. Reneum will solve this by giving everybody a way to support green projects publicly and financially, and with complete transparency at every step of the ecosystem.

Citizens don’t have a straightforward mechanism to direct climate action, especially not in the energy transition. Protests and legal action are slow and indirect. In most countries, grid-based electricity comes from fossil fuel sources. Consumers have no choice or control to select their energy mix and opt for green power, even if they want to.
With Reneum, citizens can now be part of a movement. Reneum is the largest global marketplace for renewable energy, and the first available on a totally decentralized network. Reneum empowers individuals everywhere to drive the transformation of the electricity grid by demonstrating the increasing demand for clean power. By buying RENW, you are directly impacting the future of renewable energy adoption, thereby influencing the outcome of the climate crisis.

Reneum is democratizing the energy transition by helping you make a difference in the fight against fossil fuels. Buying Reneum’s native token, the $RENW, is the easiest way to take real action. Climate Anxiety is real, but we’re here to help everyone do their part.

TO THE GLOBAL ECONOMY

Reneum drives capital through direct action on the part of households and larger entities to the environmental projects that need it the most. This is the catalyst we so badly need to meet the globally agreed-upon targets the legacy system has thus far failed to achieve.

Evolving towards a more efficient global energy infrastructure that relies upon the infinite supply of renewable sources is needed for several reasons. Not only is it financially advantageous in the long term, it also augments productivity in the near term through improving public health, preserving the natural world and liberating us all from the antiquated fossil-fueled economy of the industrial revolution. Now is the time to embrace the technological revolution.

Just like the polar ice caps, the antiquated energy infrastructure and the system of financial instruments are melting away.

Now is the time to galvanize our united will and use the technology in our hands to become financially instrumental. This is our journey. Our destination is a renewed world.

If you have made it this far and are still interested in learning more about Reneum’s goals and reading more detail on how we plan to achieve them, you can read our White Paper [here](#).