

## Decentralized Future: Blockchain, Crypto, and WEB3

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### Topic: Energy

#### How can tokenization and decentralized finance support the energy transition?

→ under the example of DOWGO

Its first important to define some terms before tackling the topic:

#### 1. Tokenization

→ The process of converting rights to a real-world asset (e.g., energy, infrastructure, carbon credits) into a digital token on a blockchain.

Example: Turning a solar panel's energy output into tradable tokens.

#### 2. Decentralized Finance (DeFi)

→ A financial system built on blockchain technology that removes intermediaries (like banks), using smart contracts to enable peer-to-peer transactions.

Example: Using a smart contract to invest in a wind farm without going through a bank.

#### 3. Energy Transition(Fig1)

→ The global shift from fossil-fuel-based energy systems to cleaner, more sustainable sources such as solar, wind, hydro, and battery storage.

Goal: Decarbonization, decentralization, and democratization of energy.

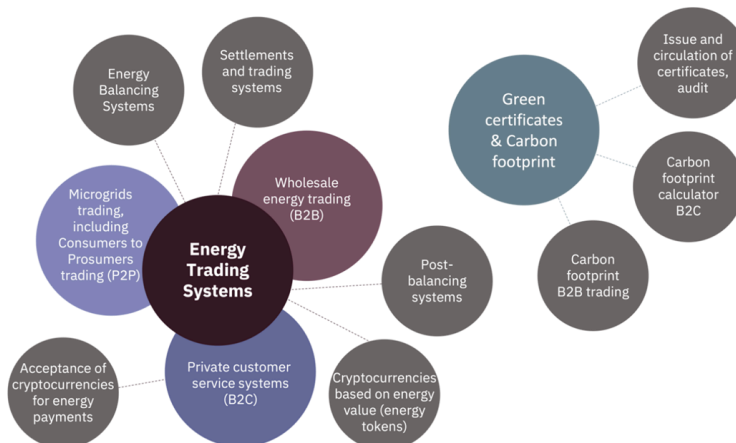


Fig. 1. Classification of blockchain use-cases in energy sector

## Foreword:

Specific new pathways being opened up by tokenization and decentralized finance (DeFi) represent a unique opportunity to rapidly finance renewables globally. This approach facilitates the process of tokenization via fractional ownership of renewable energy assets (e.g., solar panels or wind farms) and lowers capital entry barriers, democratizing the investment process. As a liquidity provider in DeFi then, slippage is a major player, as it enables a small peg of any clean energy project.

Smart contracts also provide a means for P2P (peer-to-peer) energy trading. It allows individuals and businesses to buy and sell excess energy directly, forming localized energy grids and a more efficient energy distribution network overall.

DeFi also offers a new source of capital for startups doing renewable energy work. These projects can then raise money via Initial Coin Offerings (ICOs) or Security Token Offerings (STO) without the need for traditional financial institutions. Moreover, decentralized finance has facilitated loans and the purchase of insurance without intermediaries.

The other big advantage is transparent carbon credit tracking. Just make them cleand the tokenization of these credits on the blockchain a tamper proof means of verification allowing companies and individuals to create an incentive to reduce emissions.

Tokens can also be used as a reward for sustainable behavior. For instance, users could be rewarded for consuming less energy or charging electric vehicles during off-peak hours — aligning individual behavior with broader climate goals.

But platforms such as Energy Web Token (EWT), Powerledger and DOWGO demonstrate how these technologies can help direct capital and innovation toward the clean energy transition.

## How can tokenization and decentralized finance support the energy transition?

### Traditional Green Bonds (Without Blockchain):

- **Barrier to Entry:** traditional green energy financing such as green bonds involves large initial investments, so they're closed and designed from the beginning for institutional investors. The least you can invest in production sites for green energy is 100,000 euros, a sum preventing people's participation.
- **Lower Liquidity** – Traditional investments in infrastructure and renewable energy that green bonds typically finance could be illiquid as funds are locked in for extended periods (e.g., ten years for infrastructure funds) and there's no efficient secondary market for early exits.
- **Potentially More Expensive Transactions:** The issuance and trading of bonds often requires the involvement of financial intermediaries, which imposes excessively costly fees that discourage individuals from participating in the marketplace.
- **Less Transparency:** While green bonds are designed to fund environmentally friendly projects, monitoring the flow of funds and impact may be less immediate and direct than blockchain-based systems.

- **High Barriers to Entry:** Traditional green bonds usually are large and in high denominations, so it takes a lot of cash to play, which creates high bar to entry for small investors.

#### Here where blockchain technology comes into play:

- **Greater Access to Funding:** Tokenization allows energy companies to access a larger pool of investors, including retail investors who were traditionally excluded due to the high barriers to entry. Through asset fractionalization — breaking up these assets into smaller, affordable units — anyone with a smaller amount of capital can invest in and support renewable energy projects.
- **Increased Liquidity:** Tokenization of energy assets will unlock liquidity by enabling investors to trade on secondary markets.... Investors can enter and exit investments with relative ease, which opens up demand for a broader range of capital....
- **Increased Transparency:** Blockchain is an immutable ledger technology that provides a transparent record for transactions.... (Abuarquob, F. & Sofwan, A.) Therefore, investors can in this way track the flow of energy globally and ensure its sustainable generation and use<sup>14</sup>.
- **Reduced Costs and Increased Efficiency:** Smart contracts can fully automate and streamline processes in the energy industry, such as the issuance and transfer of energy certificates and the distribution of returns, thus decimating administrative costs and operational inefficiencies<sup>1</sup>....
- **Democratization and Decentralization:** Tokenization allows decentralized energy networks, allowing consumers to buy and sell energy directly from each other without the need for traditional energy companies, fostering peer-to-peer energy trading....
- **New financial instruments:** Through tokenization, it-is possible to create novel financial instruments, such as tokenized carbon credits<sup>19</sup>, renewable energy certificates<sup>20</sup> and green” bonds to finance and incentivize sustainable practices.
- **Renewable Origin Passport:** Using blockchain, energy's renewable origin can be certified, as to provide a credible trail that fights against greenwashing.
- **Direct Producer-Consumer Relationship:** The power of blockchain and tokenization technology to improve the producer-to-consumer trajectory is consistent with the logic of decentralized systems.

#### In the Case of DOWGO:

##### Analysis: DOWGO – Green Bonds on Blockchain

##### Project Type:

- Tokenized Environmental Green Bonds
- Blockchain based platform that enables tokenized green bond investments in renewable energy projects like wind and solar farms.
- Public and permissionless blockchain

##### How it works:

- As a blockchain-based solution, DOWGO is issuing and trading equity and green bonds.  
→ Green bonds are financial instruments used to raise money for environmentally friendly

projects, especially in areas like renewable energy, energy efficiency, clean transportation, and sustainable infrastructure.

- It leverages Ethereum to create digital representations of green financial instruments.

#### **Investment Process:**

**Primary Market:** Investors can buy tokens representing new green assets issued by European renewable energy developers.

**Secondary Market:** Authorized investors can trade these tokens, providing liquidity and flexibility.

- Investors receive coupon payments and principal repayments directly to their bank accounts or digital wallets, ensuring transparency and security.
- Dowgo operates within a regulated framework, simplifying investment disclosures and aligning with ESG (Environmental, Social, and Governance) data tracking requirements.
- The platform supports investments in Euros or Euro Coin, with a 24/7 open market and no lock-up periods, enhancing investor convenience.

#### **How It Supports the Energy Transition:**

- **Funds Renewable Projects:** Investors can purchase green bonds directly via smart contracts to fund solar, wind, or other clean projects. The capital raised goes straight to building or expanding renewable infrastructure.
- **Lower Barriers:** Fractional tokenization allows smaller investors to participate. Traditional green bonds are often reserved for institutions, but DOWGO uses fractional tokenization so even small investors can participate with just a few euros.
- **Transparency & Traceability:** Each bond is logged on a public blockchain, showing how much was raised, where exactly it is going and how much clean energy is being produced. This way it can combat greenwashing and can build the trust of the investors.
- **Decentralized Access:** No need for centralized intermediaries since it's open to anyone with a digital wallet.
- **Asset Tokenization:** Renewable energy assets are converted into digital tokens, allowing investors to purchase fractions of these assets.

Dowgo is using tokenization and decentralized finance specifically to enable the energy transition by:

• **Enabling Investment in Green Bonds:** Dowgo tokenizes green bonds issued to fund wind and solar projects<sup>2</sup>, expanding participation beyond traditional institutional investors.

• **Second Market for Illiquid Assets:** Dowgo resolves the decades-long illiquidity of renewable energy investments with locked-in investment periods in the traditional market through tokenisation

of green bonds followed by secondary market (exchange) on the blockchain through which investors access the opportunity to trade USDNO on the second market using Dowgo's ecosystem....

- **Enabling Decentralized Financing:** Dowgo utilizes blockchain technology to establish a decentralized financing structure, allowing investors to invest directly in renewable energy projects without the need for traditional financial intermediaries, which may help lower fees.

- **Supporting project developers** – When a project comes online the developer gets its green bonds back. Dowgo allows the project developer to refinance when their projects get operational, freeing up that capital to develop new projects, thus scaling renewable energy capacity faster....

- **Transparency Assurance:** Since Dowgo operates on the blockchain, it assures a track of the financial performance of the financed assets and the payment of returns to investors....

### **Analysis the tokenomics of DOWGO**

Dowgo's tokenomics model offers a modern and accessible way to finance green energy projects through blockchain technology. The platform works by turning renewable energy assets—such as wind or solar farms—into digital tokens. Each token represents a fraction of ownership in a real-world project. This tokenization process, likely built on security token standards like ERC-1400, allows Dowgo to stay compliant with European financial regulations, while making investments more accessible and transparent.

One of the core features of Dowgo's system is its yield distribution mechanism. Investors receive regular returns in the form of interest or coupons, paid out directly to their digital wallets. These payments are typically made in stablecoins like EURO Coin, helping to avoid volatility. Everything is automated through smart contracts, which handle the distribution schedules and ensure accurate execution without the need for intermediaries. This setup offers a smoother, more efficient investment experience.

Beyond financial returns, Dowgo also focuses on impact reporting, a crucial aspect in sustainable finance. The platform may use smart contracts to track tangible environmental metrics, such as the amount of clean energy generated (kWh) or the CO<sub>2</sub> emissions avoided. This kind of “proof of use” allows investors to see the real-world impact of their money—making it not just a financial investment, but also an ecological one.

Dowgo supports both primary and secondary market activity. In the primary market, investors can participate in the initial issuance of green asset tokens, helping developers raise capital to build or expand energy projects. In the secondary market, authorized investors can buy and sell these tokens, offering liquidity and flexibility that traditional green bonds typically lack. The platform operates 24/7, giving users full control over when they want to enter or exit a position.

Finally, Dowgo puts a strong emphasis on regulation and investor protection. Operating within a compliant framework, it requires KYC checks and follows AML protocols. Investment disclosures are simplified, and the whole system is designed to offer a clear, user-friendly experience—whether the user is an experienced institutional investor or someone new to sustainable finance.

In short, Dowgo uses blockchain technology not as a gimmick, but as a tool to reshape how capital flows into renewable energy. Through tokenization, smart contracts, and impact tracking, it makes green investing more inclusive, more transparent, and more aligned with the goals of the energy transition.

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