What is blockchain? What are renewable energy certificates (RECs)? And how will they both interact?

SP Group is hoping blockchain marketplace will encourage wider use of renewable energy sources.

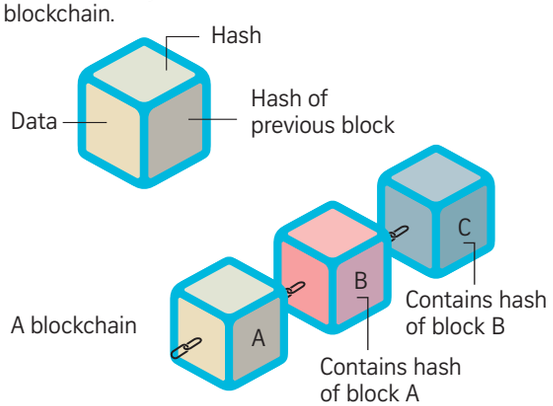
WHAT IS BLOCKCHAIN?

Imagine a digital ledger made up of a chain of blocks containing documents, which are digitally time-stamped. When a transaction is made, a document is generated. It is then distributed among other users who will have the exact copy of the document. Blockchain technology is regarded as open, transparent and public.

The block

Each block contains:

- **Data:** Information of buyer, seller and what is traded.
- **Hash:** Acts like a digital fingerprint it identifies the block and all of its content.
- **Hash of previous block:** This automatically creates a chain of blocks or blockchain.



A hash is a string of numbers and letters unique to the block and its content

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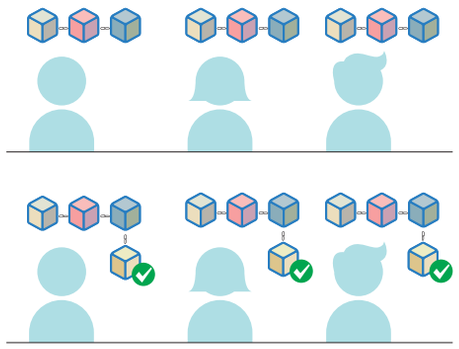
Security

- **Hash:** If block A is tampered with, a new hash will be generated in it. Block B, which contains the previous hash of block A, will detect the change and reject block A automatically.



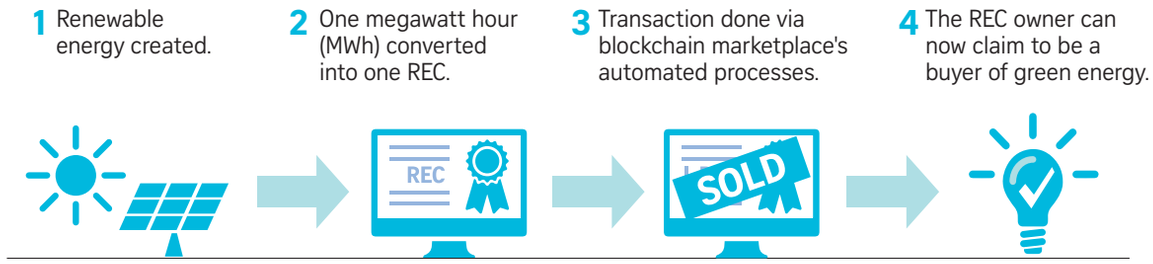
- **Distribution:** Blockchain uses a peer-to-peer network. Users can run their own node (device) to connect to the network and get the full copy of the blockchain. When a new block is created, all nodes get the new block, too. Each node validates the block and adds it to the blockchain. Any tampered blocks will conflict with existing ones, and the other nodes will automatically reject the alterations.

REC

Anyone who produces one megawatt-hour of electricity from renewable sources, like wind or sunlight, can be issued a renewable energy certificate (REC). This serves as proof that the energy it supplied to the grid is sustainable, and the REC can be bought by anybody anywhere in the world who wants to prove that it is supporting the production of clean energy. For example, if a company gets its electricity from coal, it can still buy enough RECs that are equivalent to the electricity it uses, and then say that its electricity is clean. This is a way to encourage companies and people to generate more green electricity and supply it to the power grid, because they know that others are willing to buy their sustainably produced energy at a premium price.

How RECs are sold on SP Group's blockchain marketplace

Currently, RECs in Singapore are bought and sold through a highly intensive process, where it is hard for small-scale buyers like consumers to find sellers. The blockchain marketplace will automate the selling and verification process, and make it easier to connect REC buyers and sellers.



Why more companies are going green

- **Emissions:** It lowers companies' contributions to greenhouse gas emissions.
- **Jobs:** It stimulates the economy and creates jobs.
- **Reputation:** It is a public relations boost for the companies as they show customers that they care about the environment.

Source: SP GROUP STRAITS TIMES GRAPHICS: LEE HUP KHENG

Easier for small producers to sell 'green credits'

It is now easier for small producers of solar energy in Singapore to sell "green credits" to buyers keen to offset their carbon footprint.

SP Group has launched a digital marketplace powered by blockchain technology to link up these buyers and sellers.

The power utilities firm believes this is the world's first blockchain-powered marketplace in renewable energy certificates (RECs), tradeable documents used to offset the use of non-clean energy.

The initiative was announced yesterday at the Asean Energy Business Forum at Marina Bay Sands.

For now, only small firms can access the marketplace, but it will open to households by the middle of next year.

SP Group chief digital officer Samuel Tan said: "We are thinking of products that will help our consumers choose sustainability."

He added: "Through blockchain technology, we enable companies to trade in renewable energy certificates conveniently, seamlessly and securely, helping them achieve greener business operations and meet their sustainability targets."

Currently, RECs are traded on an online registry in a manually intensive process that involves poring through spreadsheets and making sure the certificates have not already been bought.

It is also hard for small-scale buyers like individuals to find sellers and prices need to be negotiated between them.

With the blockchain marketplace, the selling and verification process will be automated, making it easier to connect buyers and sellers. This shortens a process that could stretch for months to mere minutes.

Any clean energy producer in the world that produces 1 megawatt-hour of electricity can be issued one REC.

The certificate not only serves as proof that the electricity is sustainable, but is also a document that can be sold. The goal of these certificates is to encourage the production of green energy.

SP Group's blockchain marketplace will allow the trading of RECs in 0.001 units, which is equal to 1 kilowatt hour (kWh) of electricity.

This will open up the buying and selling of RECs, nowadays mostly done by large companies, to much smaller players like households. As a gauge, a four-room Housing Board flat usually uses about 12kWh of electricity a day.

Local companies that have signed up to use the marketplace include DBS and property giant City Developments Limited (CDL).

A CDL spokesman said: "Participating in SP's blockchain-powered trading of RECs will help CDL to step up efforts to reduce carbon emissions more conveniently, seamlessly and securely."

The developer said it aims to be powered completely by renewable energy by 2050, and that buying RECs would be one of its strategies towards this goal.

One seller of these certificates here is chemical logistics company Katoen Natie Singapore, which will soon launch the Republic's largest single unit rooftop solar facility.

A spokesman said: "Katoen Natie will be embarking on a second phase of expansion for our solar energy plant here in Singapore. With the expansion, we are expecting excess capacity that can be traded on the REC platform."

The marketplace is accessible at www.spgroup.com.sg/rec

Jose Hong