Virtual Community Renewable Energy Network

While solar energy is taking off in many parts of the world, it’s still restricted to long-term homeowners who have access to their rooftop for installing solar panels. As an alternative, though, we could create a blockchain network where anyone could invest in renewable energy and benefit from them, while reducing their emissions.

A community solar project is one where many members subscribe to a solar farm. The output of the solar farm is purchased by their utility, which credits the members of the solar project on their utility bills. This allows people who are renting, who live in multi-unit buildings, or who are temporary residents to gain the financial and environmental benefits of solar energy without entering into long-term contracts for installing solar panels at their homes.

In this MVP concept, we will build a Virtual Community Renewable Energy Network which is similar to a community solar project. It would allow multiple parties to share in a renewable energy project together through tokenized Renewable Energy Certificates (REC’s):

1. Members jointly invest in a community solar or wind project
2. The project sells its energy to a utility off taker
3. The project creates and registers REC’s for its energy
4. The REC’s are transferred back to the members to offset the non-renewable portion of their utility bills
5. The sale of energy from the project to the utility above its cost of capital is used to lower the cost of the members’ utility bills.

The data would come from:

- Solar inverters – amount of electricity generated, if the project shared a solar farm
- Renewable Energy Certificates – purchased from renewable energy developers
- Utility bills – energy use by the members

A smart contract could obtain data for all members of the network from these data sources, then allocate the solar or REC’s against each member’s utility bills.

The REC’s could be purchased from Green-e list of sources, such as the Bonneville Environmental Foundation. They would be registered with an authority such as WREGIS to prevent double-counting and then tokenized on a public blockchain ledger. The REC’s would follow standards such as those being developed by the Interwork Alliance.

The utility bills would be placed on a permissioned Hyperledger Fabric utility emissions data channel.

The REC’s and utility emissions would be calculated together on the net emissions channel.

An additional blockchain could be set up to manage members’ subscriptions, so that new members could stake to join a network or purchase shares from exiting members. The exact mechanics would depend on the local regulations for community solar projects.

Because renewable energy projects are long-term investments, they produce a stream of projected REC’s and cash returns. If we develop a market for forward REC’s by allowing people to purchase or sell them in future years, we could let people with short-term leases subscribe to the network and get the benefit of renewable energy.

References:

CDM ACM0002: Grid-connected electricity generation from renewable sources --- Version 20.0

VCS Project 1090

VCS Project 2257