

# BLOCKCHAIN TECHNOLOGY FOR CLIMATE POLICY IMPLEMENTATION

LIVE WEBINARS • NOV 2021 - JAN 2022

## WEBINAR 2 TRANSITIONING TO RENEWABLE ENERGY THROUGH BLOCKCHAIN

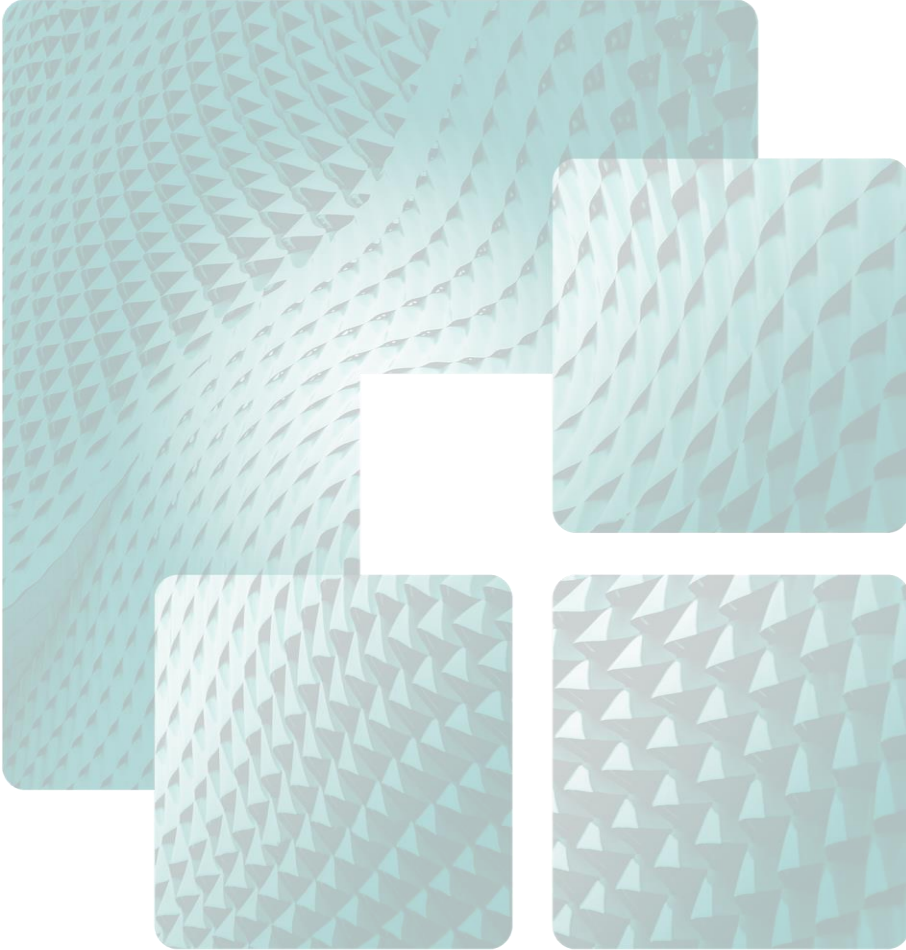
*In collaboration with*



**CTCN**

CLIMATE TECHNOLOGY CENTRE & NETWORK





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# Current Energy Sector Challenges

- Traditional electricity grids are outdated
- They are not designed to support multiple producers and millions of consumers
- Monopolistic design: entry barriers for smaller generators/alternative sources
- Difficult to transition to renewables
- **The energy market requires a new model**



# How can Blockchain Help?

## **Blockchain democratizes energy supply by making it:**

- More accessible in all markets globally;
- Distributing benefits more equally; and
  - Decentralizing decision-making.

## **Three T's - Fundamental features**

- Transparency between users;
- Transaction costs to be negligible; and
- Tracking of end-to-end transactions: accurate, easy, permanent.



# Key Blockchain Concepts for Energy

SMART  
Metering

Microgrids

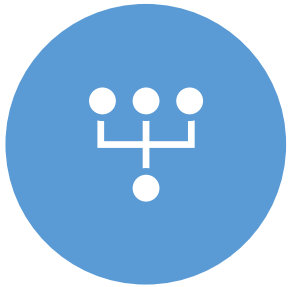
Scalability

Prosumer

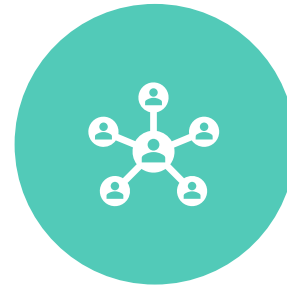
Solar Cell  
Leasing

Peer-to-  
Peer Energy  
Trading

# Microgrids



What is a microgrid?



What is a decentralized microgrid?



[The Brooklyn Microgrid](#)



Energy trading,  
Prosumers, No Central  
Authority



# What is a microgrid?

- A self-sufficient energy system that serves a discrete geographic footprint:
  - college campus, hospital complex, business centre or neighbourhood
- Has one or more kinds of energy technology that produce its power:
  - solar panels, wind turbines, combined heat & power, generators
- Some contain:
  - energy storage (typically from batteries)
  - electric vehicle charging stations

Microgrids function by the principle of community collaboration.

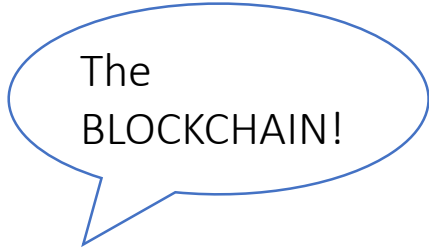


## What is a decentralized microgrid?



## Energy trading, Prosumers, No Central Authority

In a fully decentralised microgrid, prosumers participate in **Peer-to-Peer (P-2-P)** trading, They can transact **their surplus energy**.



Two layers in a P-2-P energy network :

1. The virtual layer is the secured connection between **prosumers** within which all information passes. It provides equal access for all participants, facilitates buy and sell orders and carries out transactions.
2. The physical layer refers to the physical network that facilitates the transfer of electricity from sellers to buyers once the transaction completes in the virtual layer.



# Visualising a Blockchain-based Microgrid

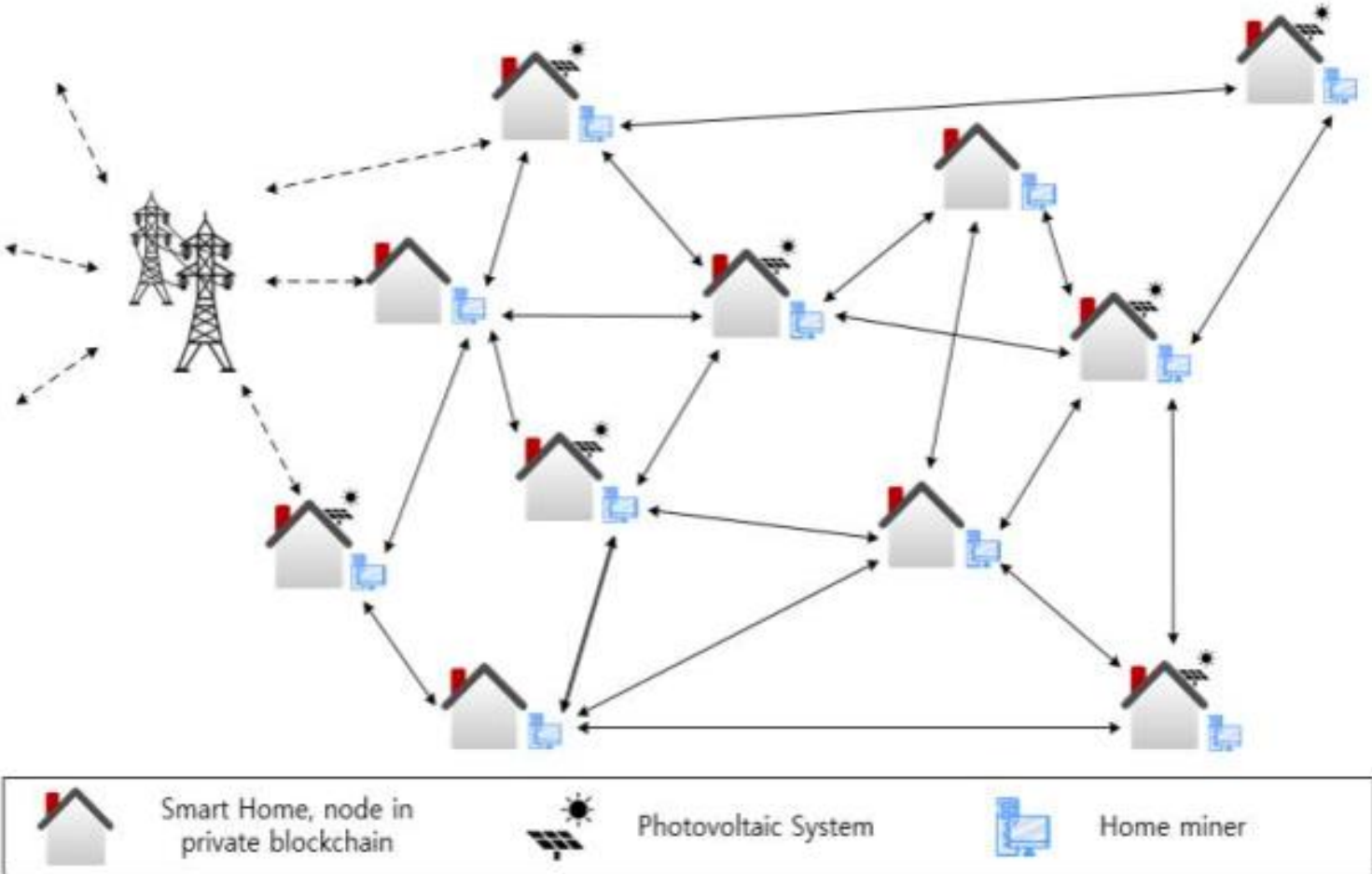


Figure 1. Exemplary microgrid on a private blockchain network.



**THANK YOU**