

Building the

DECENTRALISED UTILITY ON THE ETHEREUM BLOCKCHAIN

Ecosummit Berlin 2016



ethereum



Ethereum Blockchain | An Overview

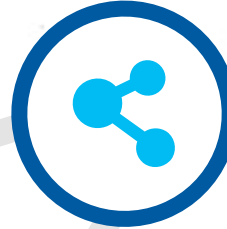
Cryptographically Secure

Uses tried and true public/ private signature technology. Blockchain applies this technology to create transactions that are impervious to fraud and establishes a shared truth.



Decentralized

There are many replicas of the blockchain database and no one participant can tamper it. Consensus among majority participants is needed to update the database.



Data & Smart Contract

The Ethereum blockchain can store both data and Smart Contract ("Logic") in the blockchain



Immutable Ledger

Blockchain is a write-once database so it records an immutable record of every transaction that occurs.



The blockchain provides a trust framework that allows systems to be developed for actors to interact reliably and securely

Blockchain Characteristics



Blockchain technology enables decentralized ledgers and secure value transfer mechanisms to provide significant infrastructure and business processes for financial institutions.

- Blockchain Characteristics

Benefits

Digitized

- Simplicity and efficiency through use of digital identity of all actors in the system
- Auditability and improved access by storing coded references to documents and signatures
- Ability to trade physical assets through representative digital token of value with provenance tracking

Decentralized

- Eliminates need for central approving authority for transaction and related latency
- No single point of failure or attack
- Reduced need for supervision and associated costs
- Reduced settlement risks and transaction costs

Programmable and Secure

- Transactions are cryptographically signed using industry leading protocols like SHA-256
- Smart contracts enable data and process to co-exist reducing process redundancies and errors
- Support for multi-signature authentication and authorization helps further reduce fraud

Immutable

- Immutable ledger for improved auditability and record keeping
- Reduced risk of accounting fraud
- Improved access and monitoring for regulators

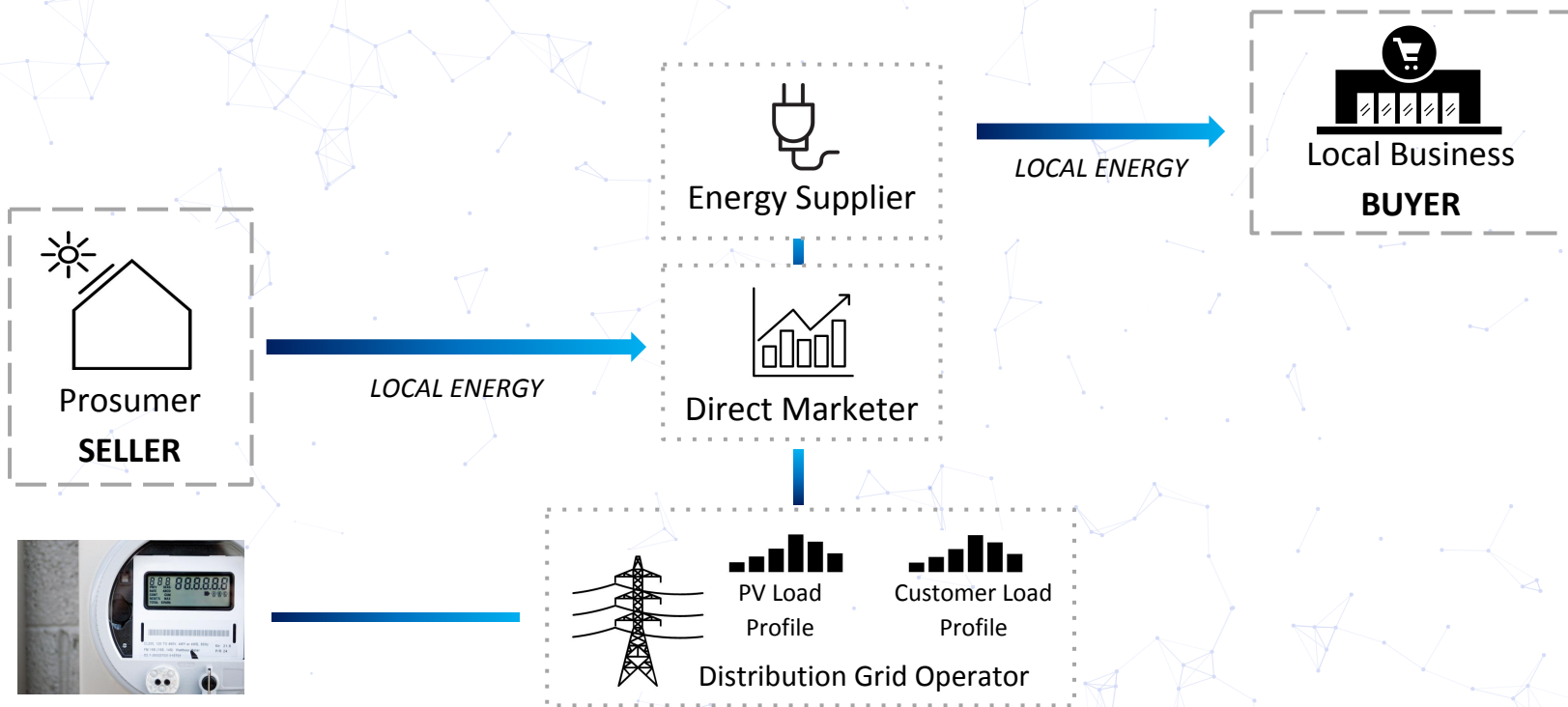
Blockchain Configurations



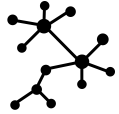
There are three patterns of blockchain configurations to suit varied use case needs

Configuration	Details
Public Blockchains	<ul style="list-style-type: none">• Trust-less due to consensus algorithm enabling anyone to join as a participant• Must be expensive and difficult to publish a block to prevent fraud and spam (proof of work/mining)• Examples include the public Ethereum and Bitcoin networks• Digital currency or tokens (e.g. Ether) are used to pay to process transactions and smart contracts
Consortium Blockchains	<ul style="list-style-type: none">• Consortium blockchains are also called Semi-Private or Shared Permissioned Blockchains• Only verified participants are allowed to publish blocks• Optimized consensus algorithms enable much faster transaction times than public networks• Does not require digital currency for transaction processing, though tokens may be valuable
Private Blockchains	<ul style="list-style-type: none">• Private blockchains are also called Permissioned Blockchains or Sandboxes• Designed for rapid application development and instant deployment• Suited for single enterprise solutions that can be configured for high throughput• Does not require digital currency for transaction processing, but tokens could be useful

Connecting buyer and seller with existing processes



Building the decentralised energy customer journey



Decentralisation



Renewable Energy



Locality



Sharing Economy

Trends driven by:

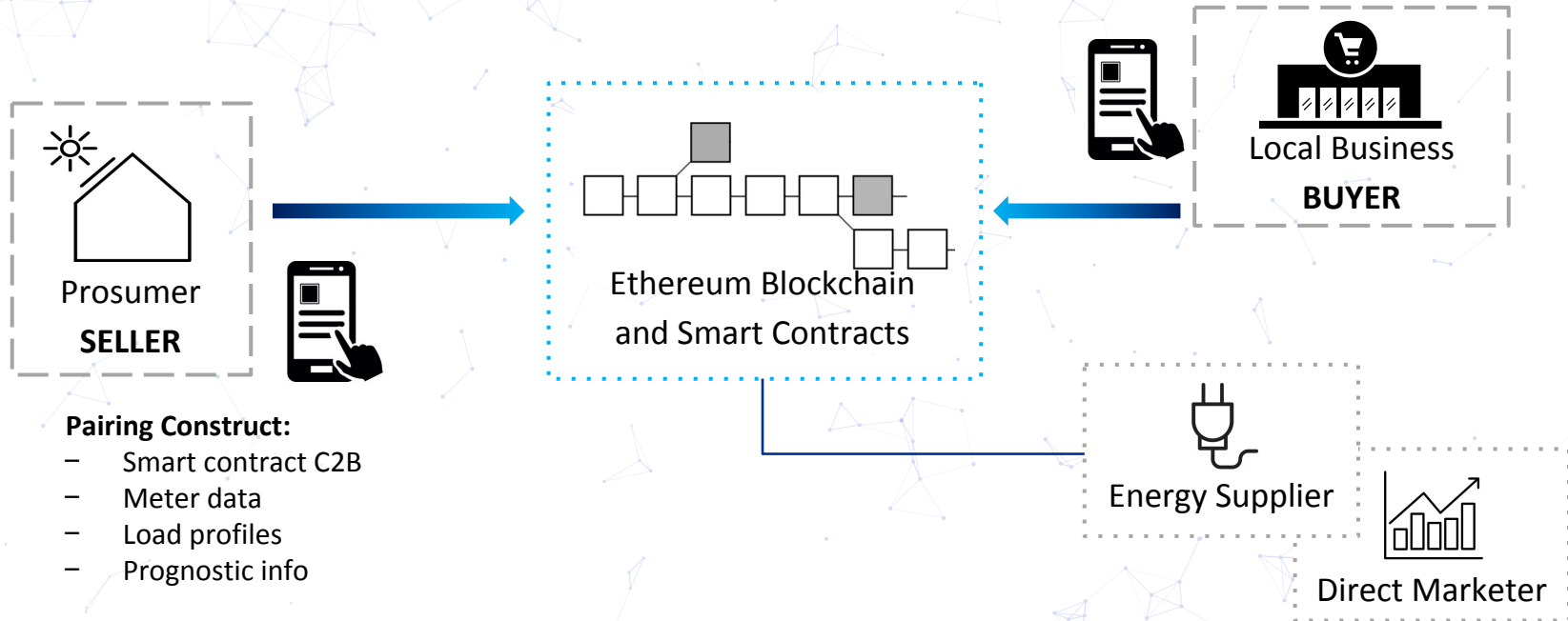
- Technology
- Economics
- Evolution in Regulation
- Efficiency
- Cost to serve
- Aspiration
- Society

But real consumer / prosumer demands are uncertain...

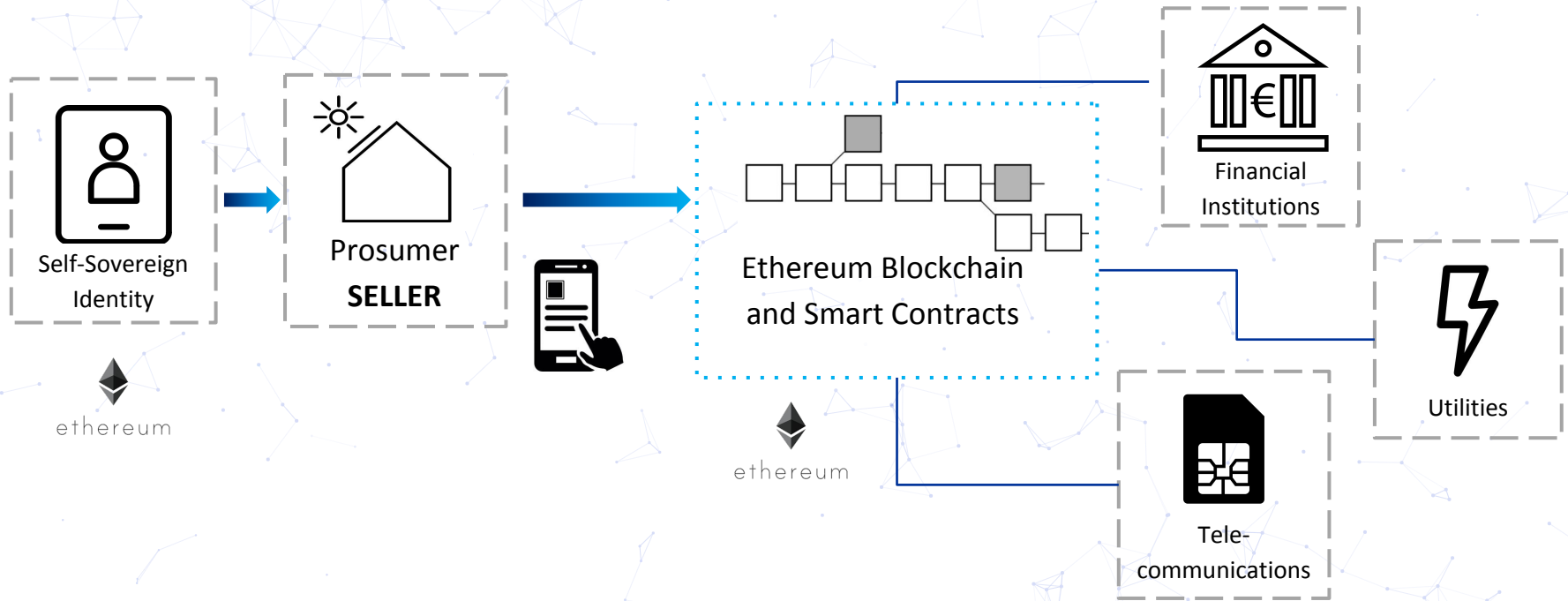
Validate:

- Building an MVP
- Research and experiment
- Customer insights
- Evolving role of the utility

Integrating blockchain in a decentralised energy solution



The Ethereum blockchain is a transactional and business logic framework



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