

BUILDING THE MODEL

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Why distributed ledger?

- Distributed data infrastructure required for networking markets
 - And for establishing new markets
- Distributed ledger technology provides:
 - Immutability
 - Configurable transparency
 - Security
 - A level playing fields for parties participating in the ledger
 - Unique identifiers for resources or transactions
 - Automated mechanisms for enforcing market rules (smart contracts)



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This isn't bitcoin

- Distributed ledger technology does not have to...
 - Use energy intensive mining for the global consensus mechanism
 - Proof of stake or Byzantium fault tolerance can be used instead
 - Be entirely transparent
 - Some carbon market data may be financially sensitive
 - Be entirely open
 - Market authorities may require special permissions or functionality

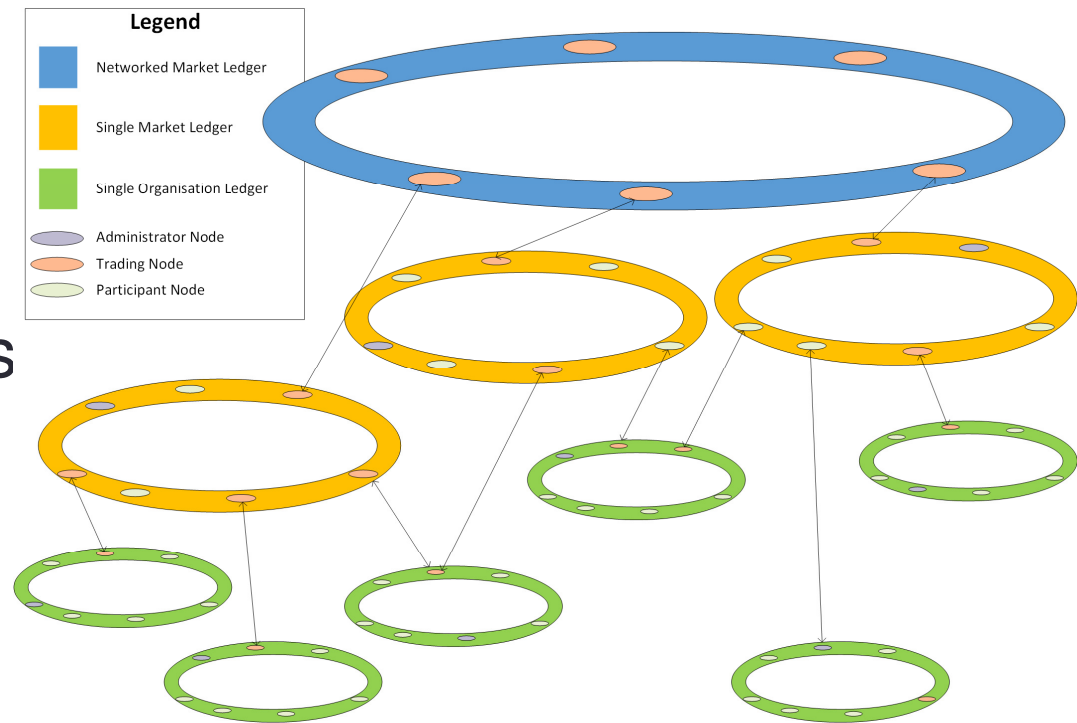


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Ledgers, markets, and companies

- Three different levels:
 - Company/organization
 - Single market
 - Networked market
- Federations of ledgers enable these different levels
 - Same technology, different configurations



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This isn't one ring to rule them all

- Carbon markets are diverse
- A single distributed ledger for all carbon markets would require:
 - Homogenisation of legal, procedure, administration, etc...
- Federating markets avoids homogenisation
 - Network markets together rather than force a single market

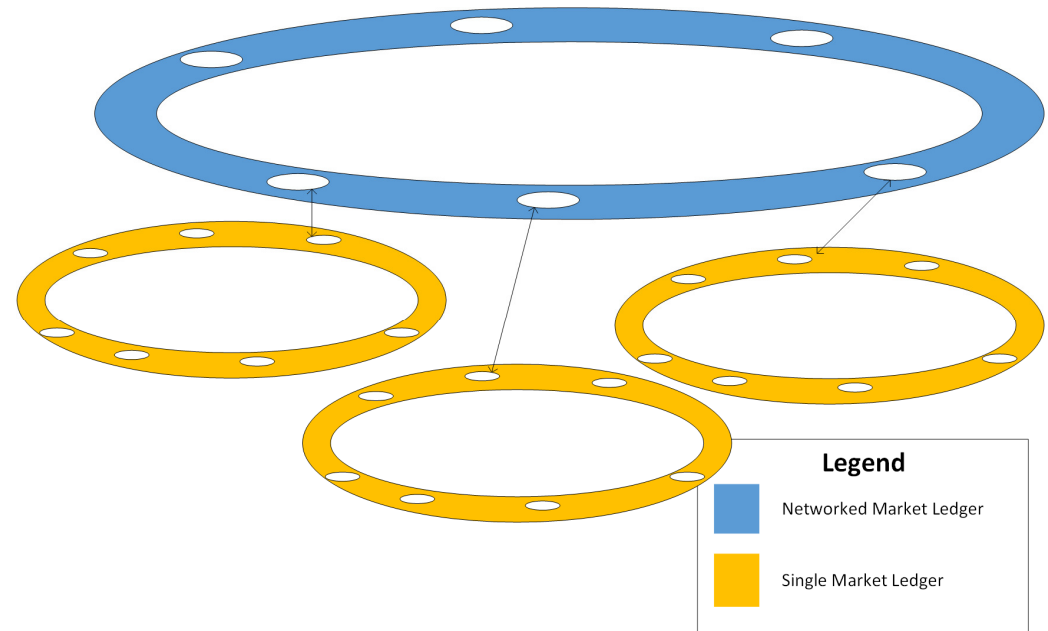


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A ledger for a networking

- Key design choice is to use a ledger to network the markets
 - Networked market ledger records inter-market trades and provides point of conversion between markets



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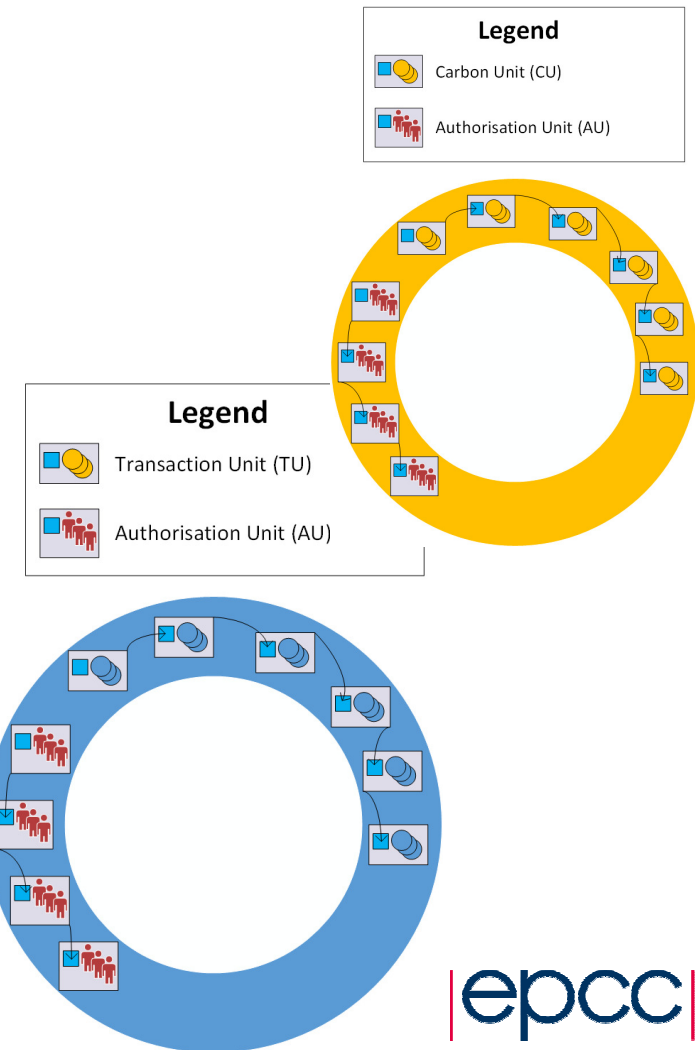
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What is in the ledger

- Single Market Ledger:
 - Carbon Unit (CU)
 - Authorisation Unit (AU) for permissioning functionality
- Networked Market Ledger
 - Transaction Unit (TU)
 - Authorisation Unit (AU) for permissioning functionality



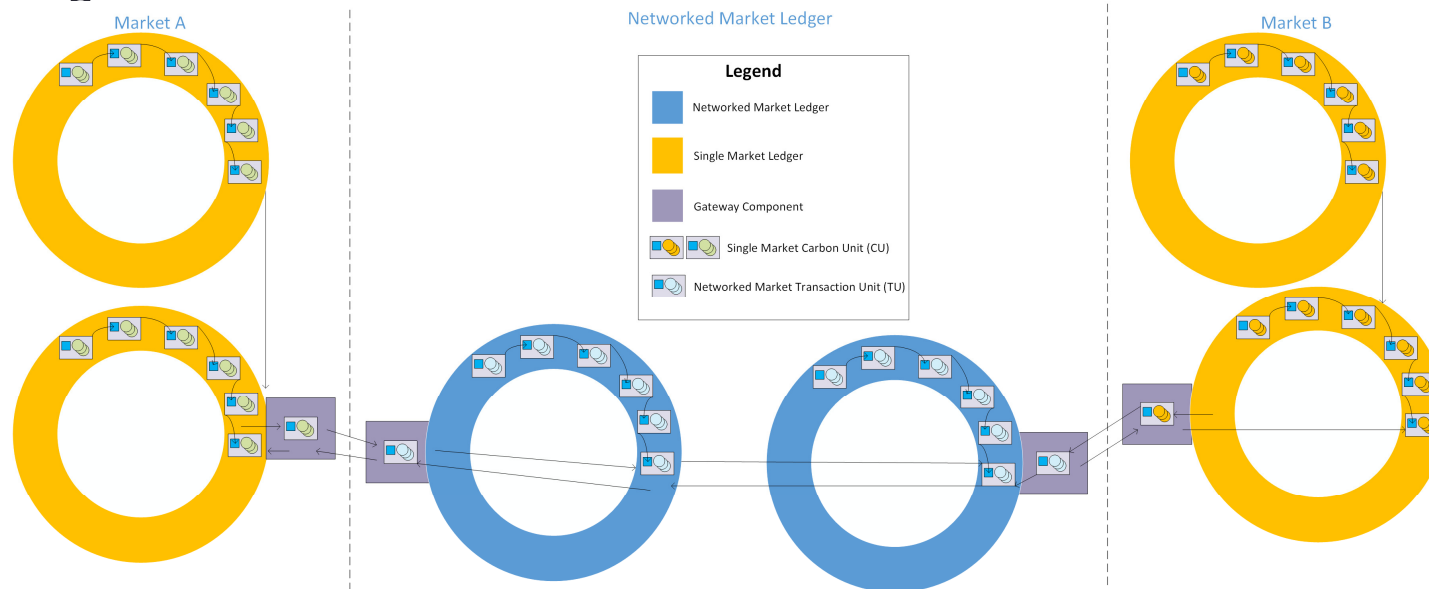
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Converting between markets

- TU is the conversion between one market and another
 - Mitigation value can be used in this conversion



How to trade

- Different possible options for trading between markets
 - *Trading Through*
 - Source market local CU converted to TU (in networked market)
 - Then TU convert to destination market local CU
 - Both conversions can use mitigation value
 - TU source and destination recorded in the networked market ledger
 - local CU used for compliance purposes
 - *Trading To*
 - Source market local CU convert to TU (in networked market)
 - Ownership transferred in networked market
 - TUs persist in the networked market for compliance purposes



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Different options for different markets

- Distributed ledger for local market, interfaces with networked market ledger
 - unique identifiers of local CU used in TU trades
- Local market runs its own data infrastructure and uses an interface to trade with the networked market ledger
 - interface generates unique identifiers for use in TU trades using local market data (configurable)

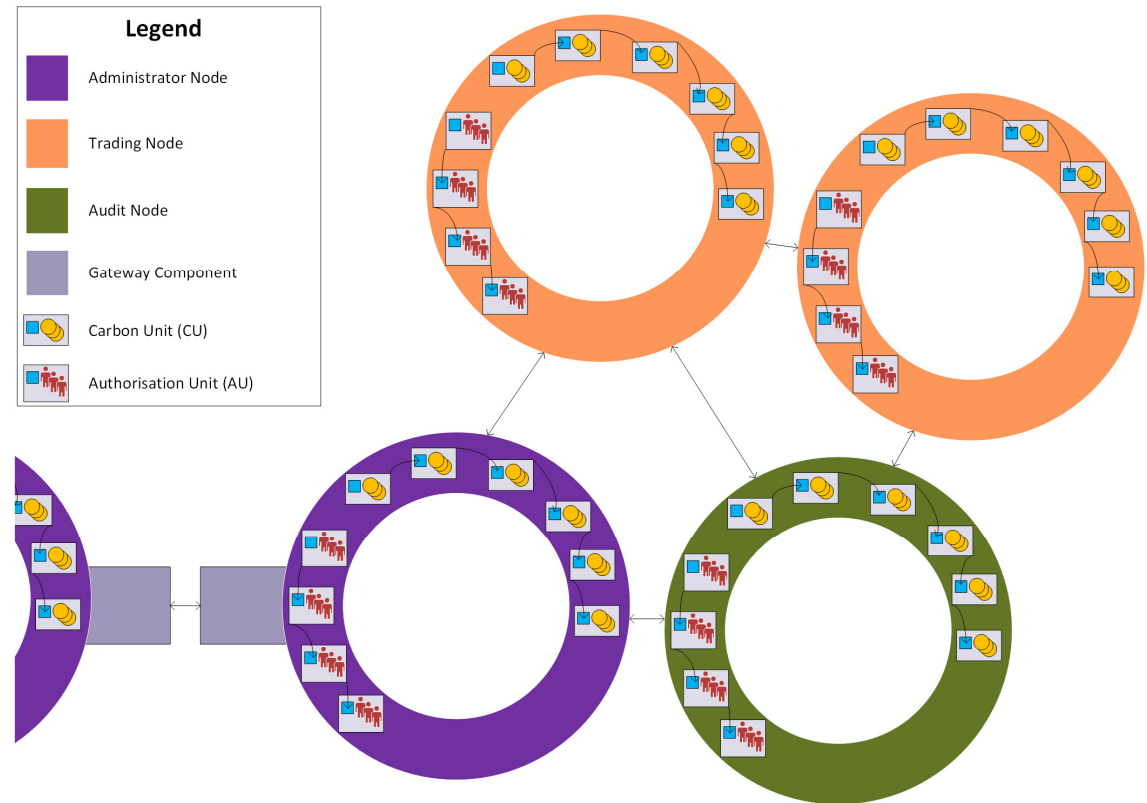


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Different permissions

- Different types of ledger node are possible, i.e.:
 - Administrator
 - Trading
 - Audit



Trading Markets

- The networked ledger has the potential to support trading markets
 - TUs can be bought and sold by third parties, rather than just used as an intermediary between separate markets
 - TUs could be used to store value and support direct trading and futures markets, both in *trade through* and *trade to* models



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DLT4NCM

- Distributed ledgers have the potential to provide the infrastructure required to network carbon markets, realise the potential of mitigation values, and easily establish new carbon markets
- Federating ledgers enables separate markets to be maintained whilst supporting easy networking
- We are still developing these ideas, so welcome feedback and contributions...



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