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# Real Time Emissions Monitoring.

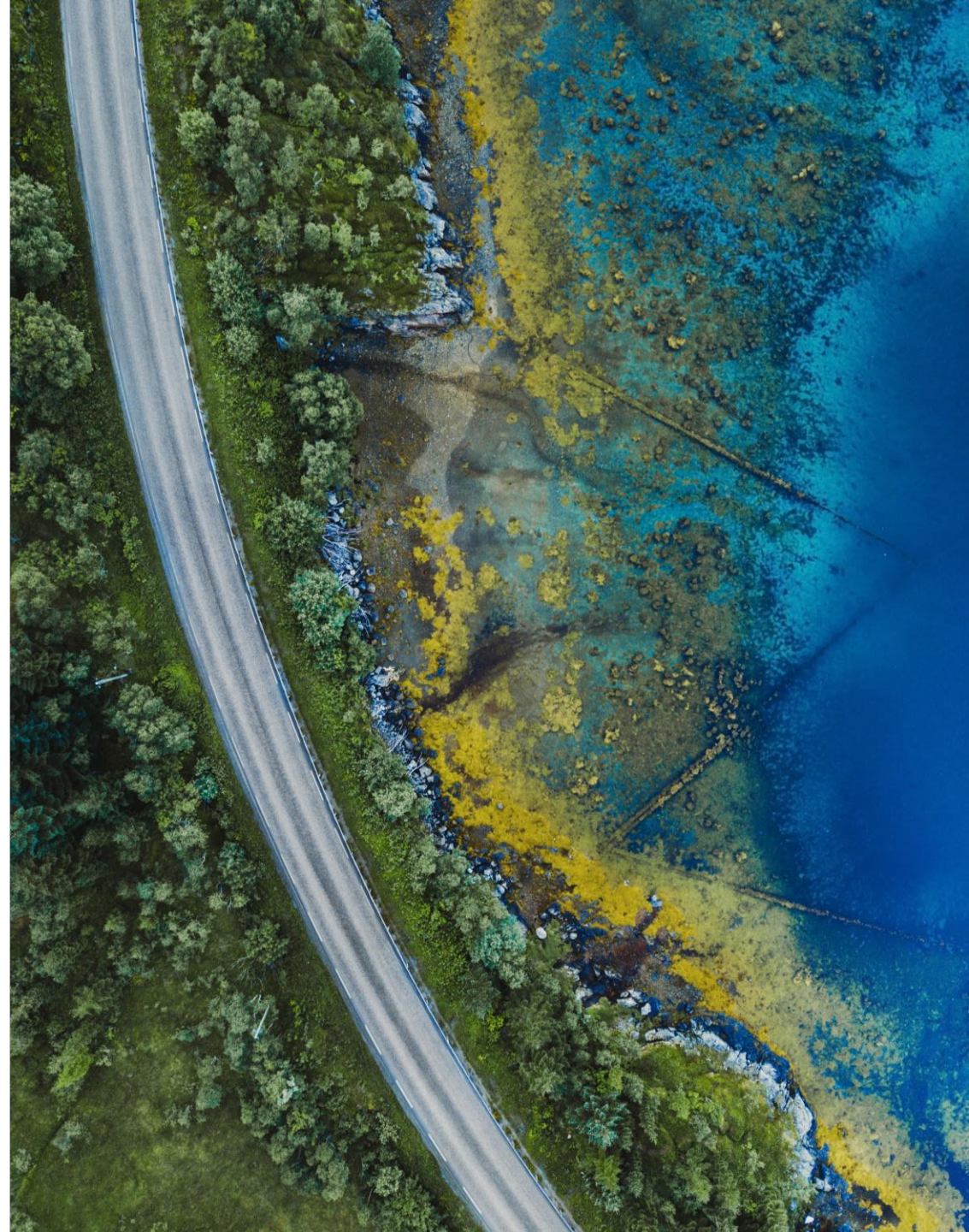
the foundation of a Blockchain enabled  
carbon economy

Preben Nielsen

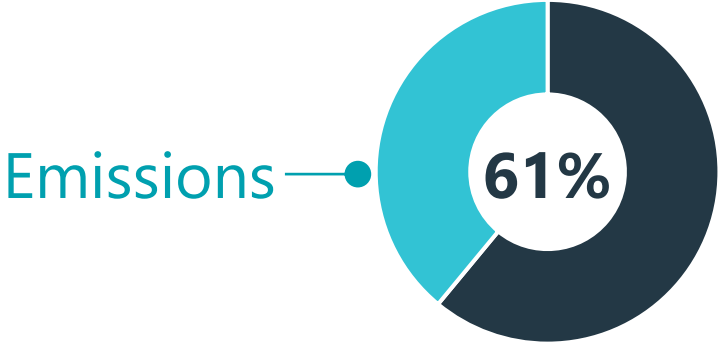
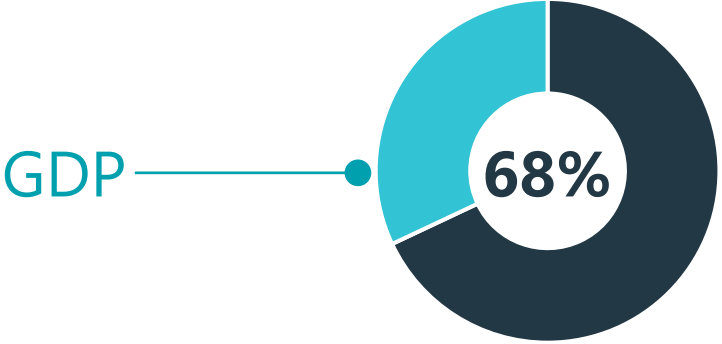
15<sup>th</sup> June 2021



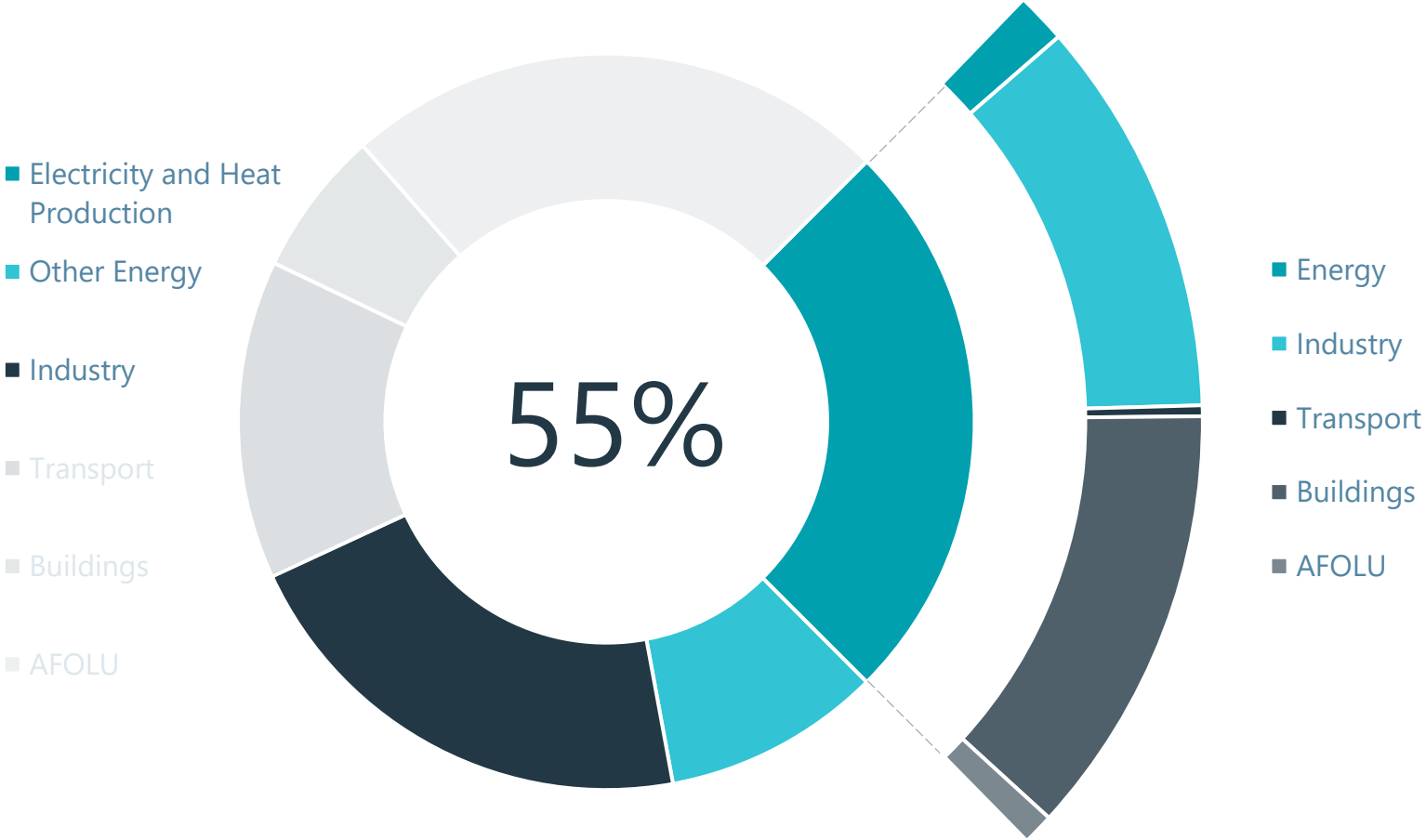
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# The state of play



Source: ECIU: Net Zero Ambition Globally

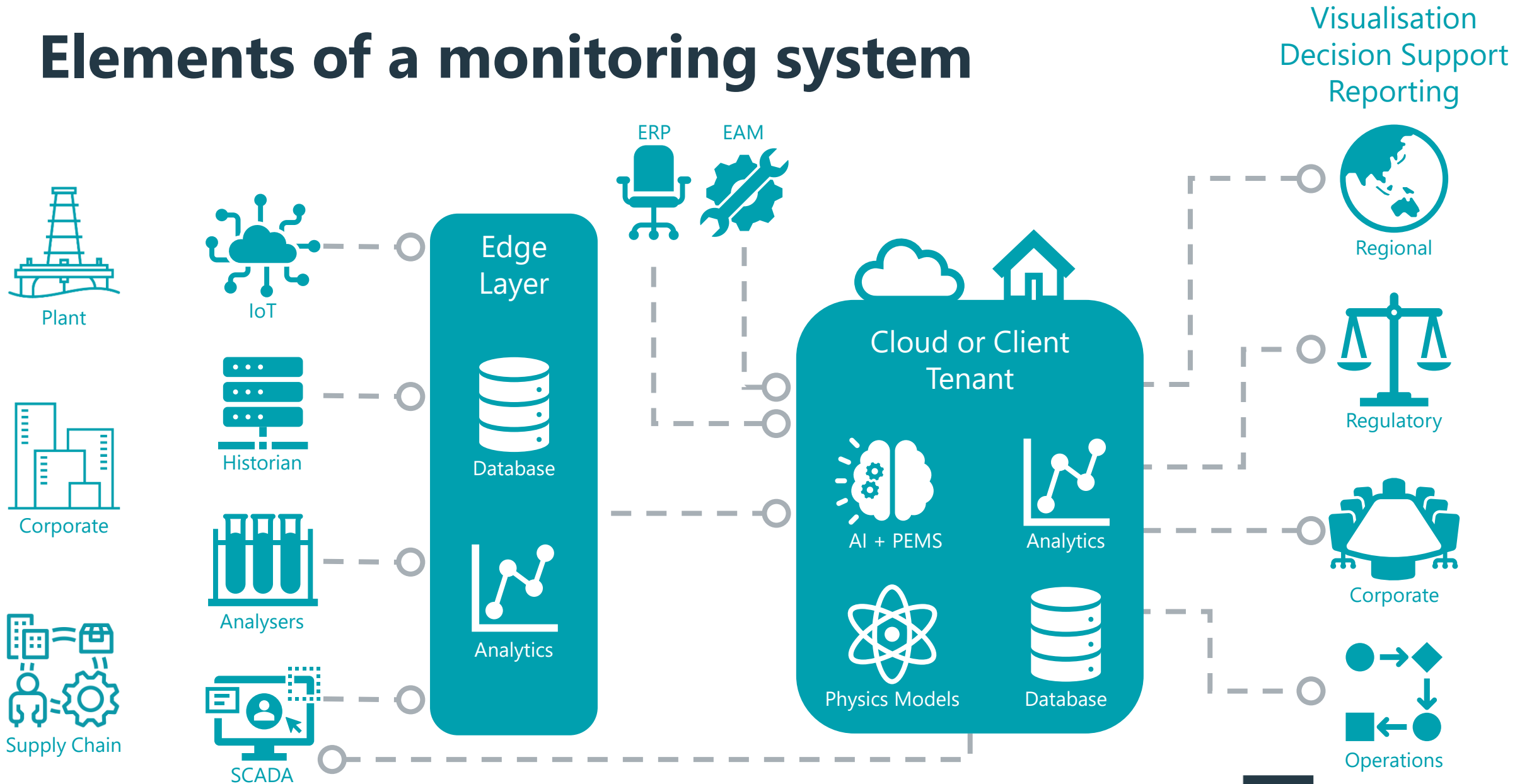


Source: IPCC: Climate Change Working Group III

# Emissions monitoring

carbon and emissions data management,  
analysis, compliance and optimisation

# Elements of a monitoring system



# Why monitor emissions?

## BENEFITS



Inform from the **boardroom** to the **shopfloor**



Resolution across **temporal** and **spatial** domains



Reporting over **Scope 1, 2 and 3** emissions



Review **past** events and set **future** roadmap

## FEATURES



**Connected** to all data sources and systems



**Automated** decision support and reporting



**Reliable** information and operation



**Transparent** and **auditable** analysis

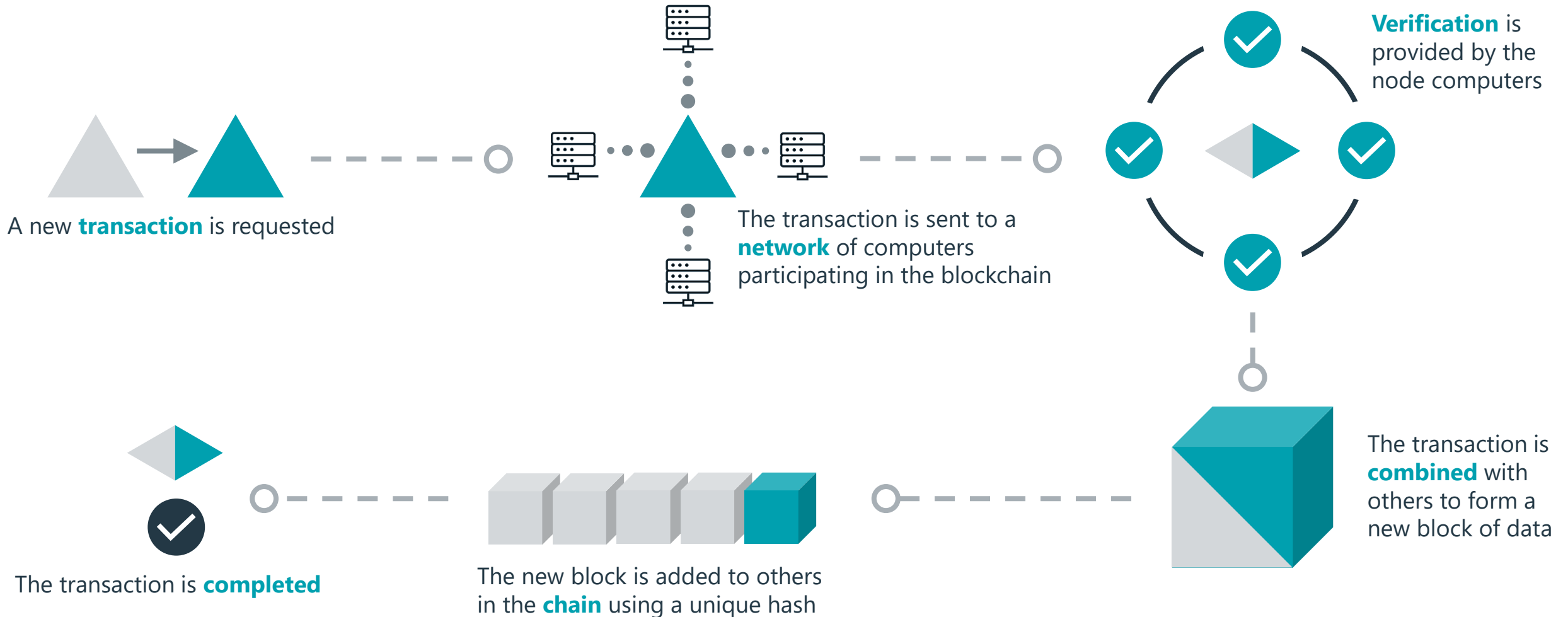


**Secure** collection and storage of sensitive data



# Blockchain

A blockchain is a secure database consisting of a **distributed ledger** of data or transactions which is shared across a network of computers



# Blockchain features



## Consensus

kən'sensəs

Node members **combine** to ensure the validity of each transaction



## Provenance

prɒv(ə)nəns

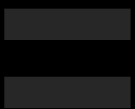
Originator and destination of each asset is **tracked** and **recorded**



## Immutable

ɪ'mju:təb(ə)l

The record is **protected** by the chain encryption hash



## Finality

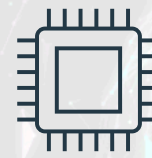
fʌɪ'nælɪti

All copies of the distributed ledger hold the **same record**

# Smart Contracts



Terms and details of a contracts are **agreed** by all participants



The contract is **coded** into the ledger



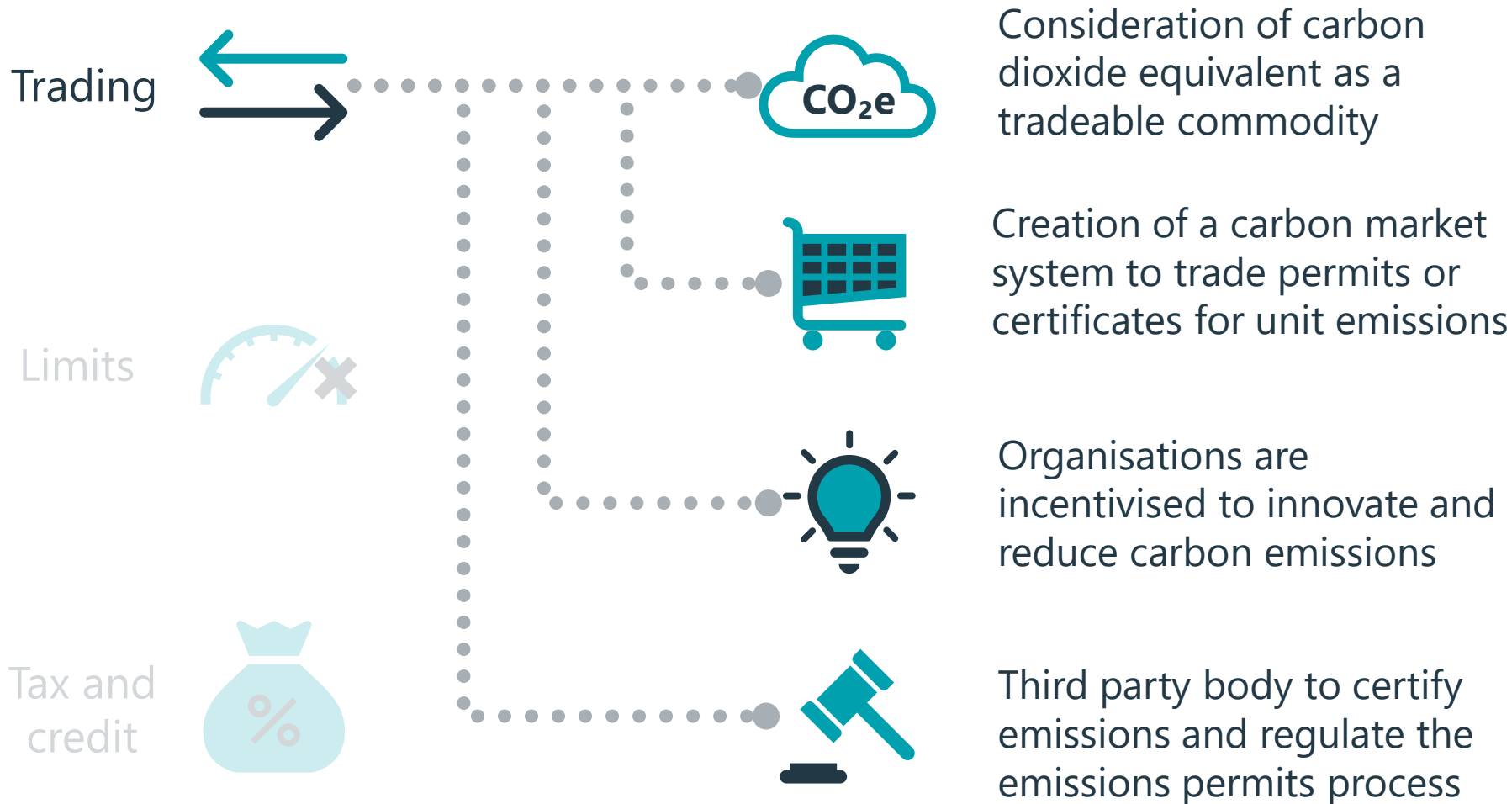
Events or predetermined conditions **trigger** the contract



Events can be **verified** and all conditions are **trusted**



# Economic mechanisms for carbon reduction



Consideration of carbon dioxide equivalent as a tradeable commodity

Creation of a carbon market system to trade permits or certificates for unit emissions

Organisations are incentivised to innovate and reduce carbon emissions

Third party body to certify emissions and regulate the emissions permits process

“A price on carbon unlocks the potential of the private sector, like business and investors to contribute more and faster to addressing climate change by ensuring an economic incentive.”

Feike Sijbesma, Former CEO of Royal DSM

# Regulatory reporting

An initial step towards trusted emissions trading



## Emission Data Oracle

Equivalent emissions data is added to the blockchain together with a verification and audit report



## Continuous Reporting

Regulatory compliance reporting can be moved from time-discrete reporting to a continuous consensus



## Automated Efficiency

Regulator does not need active involvement resulting in efficiency and greater transparency

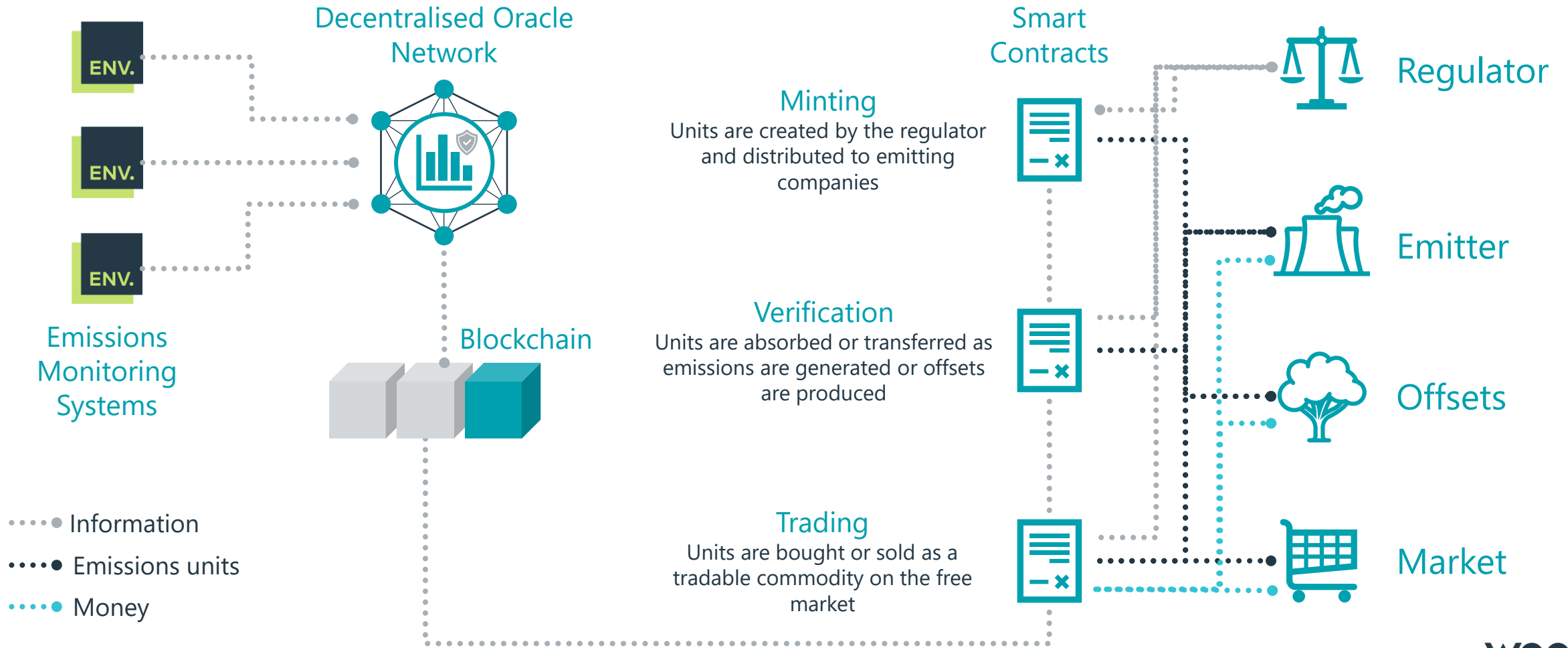


## Verified and Trusted

Ledger is shared with all member organisations in a private permissionless blockchain

# Automated carbon trading

## Driving carbon reduction with efficient and transparent transactions



# ENVision × Blockchain

- Traceable and auditable emissions monitoring
- Immutable record with actionable transactions
- Benefits for all parties involved
- Driving lower overall carbon emissions



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