

**BREAKOUT SESSION**

# Making the XRP Ledger more Sustainable

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# Introduction



# What is a decarbonization strategy?



# A company's impact on the climate

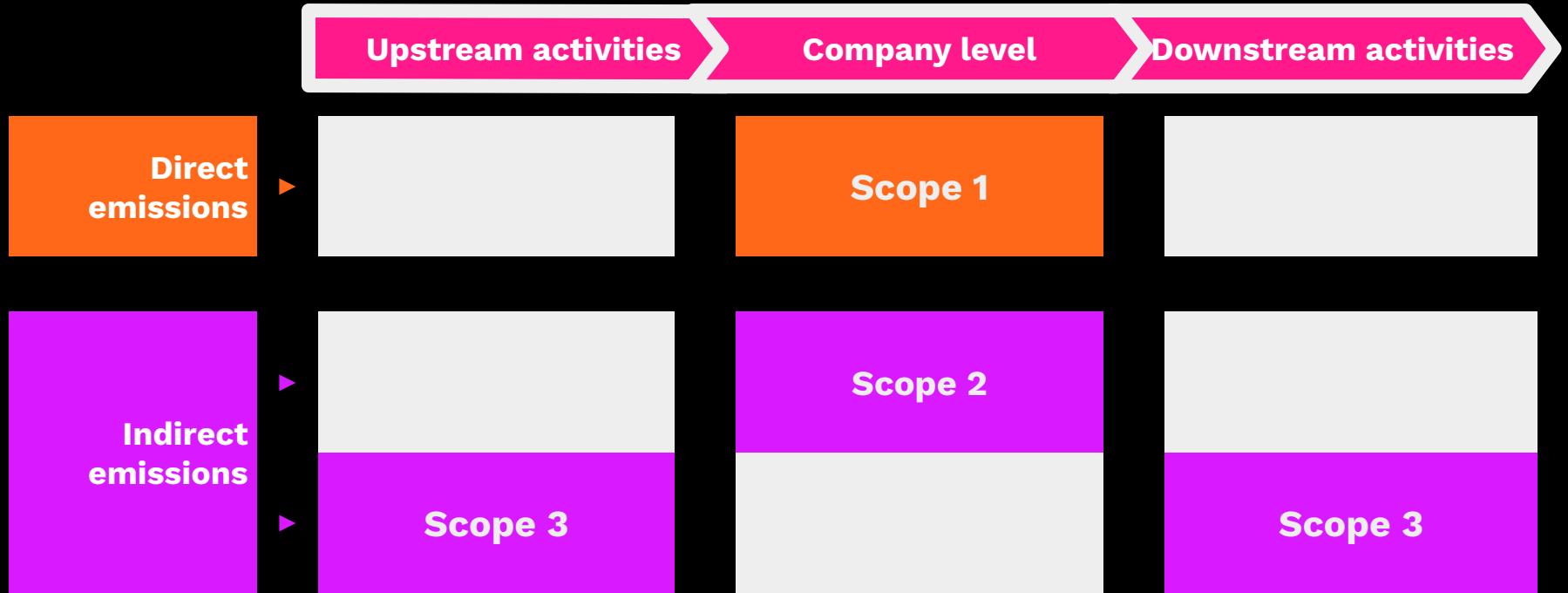
=

**CO<sub>2</sub> emissions** generated by its  
**activities**

actually all greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, O<sub>3</sub>, etc.). but for simplicity we count in CO<sub>2</sub> equivalent, or CO<sub>2</sub>e

Emission sources are classified per activity, by category and by scope

# Carbon emissions scopes



# Carbon footprint calculation

we **list** the activities induced by the company

we collect data (different physical units)

we **find** a converter (emission factor)

**multiply** and you get the carbon footprint (unit tCO<sub>2</sub>e)

Heating offices

132 000  
kWh  
of electricity

x

60 gCO<sub>2</sub>e / kWh

=

8 tCO<sub>2</sub>e

Buying computer equipment

80 Macbooks  
built and  
delivered

x

185 kgCO<sub>2</sub>e /  
computer

=

14.8 tCO<sub>2</sub>e

Air travel

4,800,000 km  
travelled

x

190 gCO<sub>2</sub> /  
km.passenger

=

912 tCO<sub>2</sub>e

# Decarbonization vocabulary

**Long term ambition:**

*Run & finish a  
marathon*



**Target**



**Near-term  
commitment**



**Tested and approved  
training approach:**  
*join a running group*

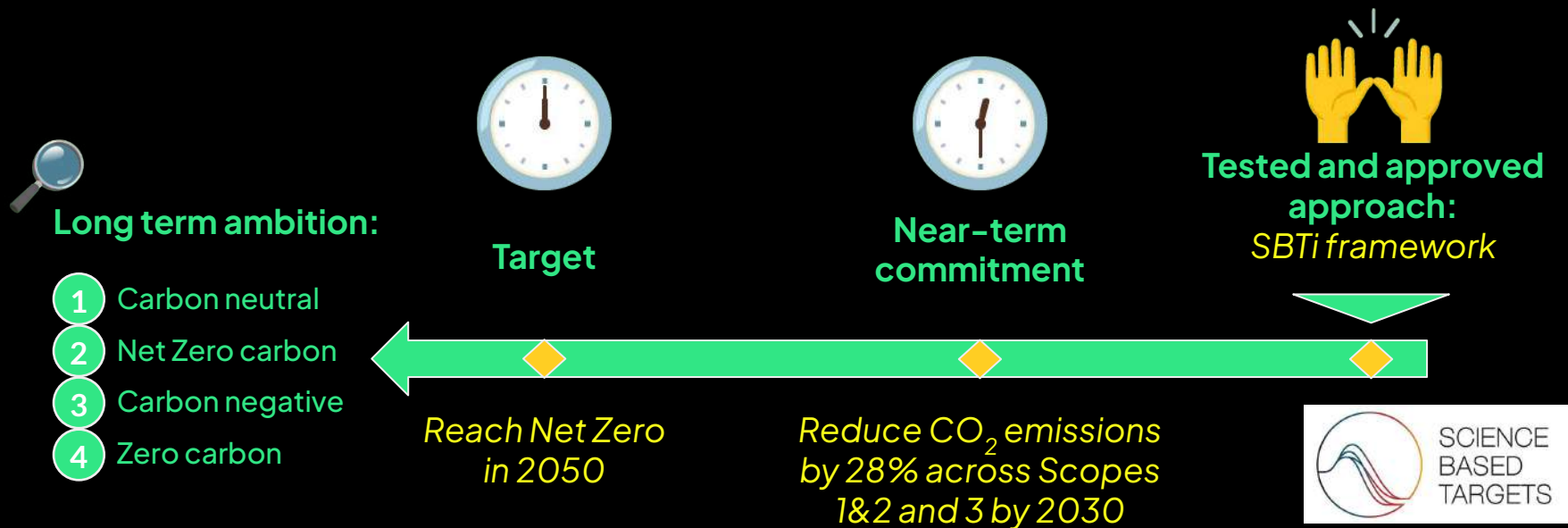


*Run a marathon  
under 4 hours*

*Run a semi-marathon  
under 2 hours*

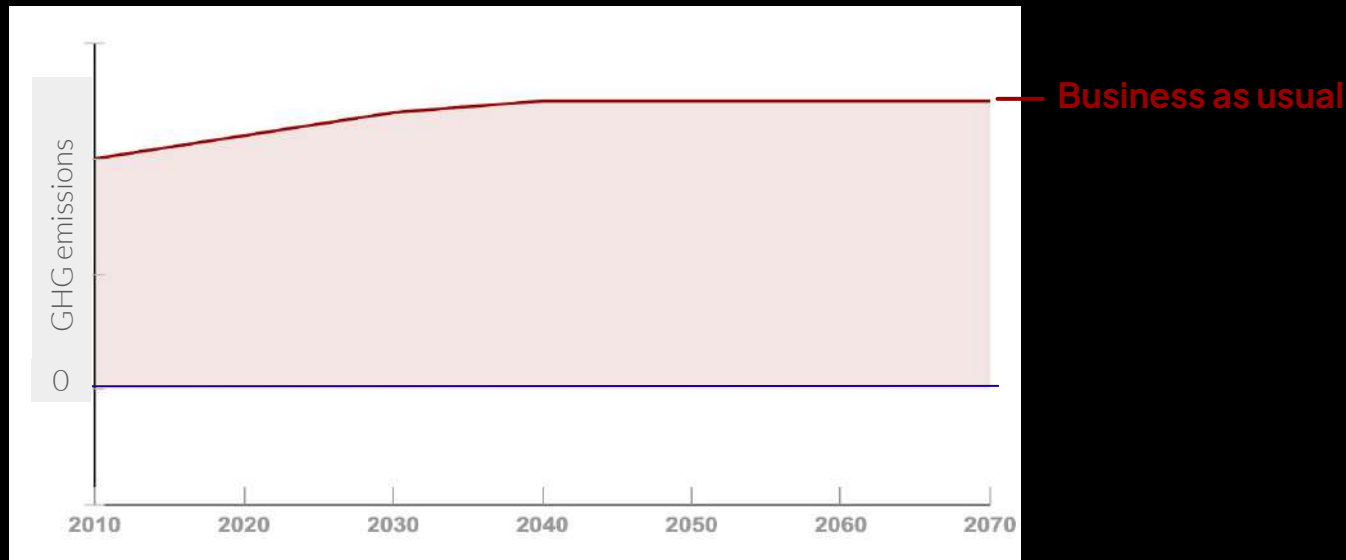


# Decarbonization vocabulary



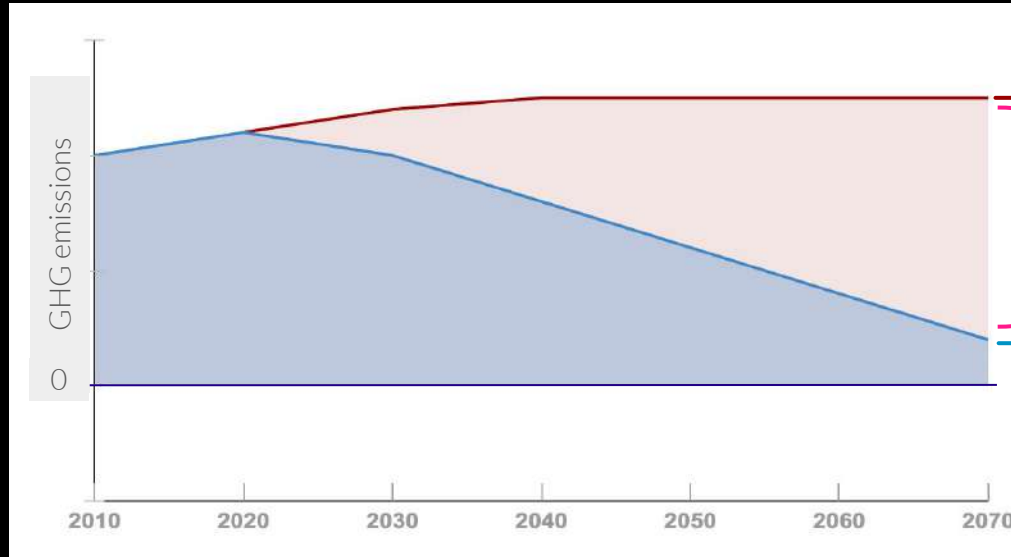
# E.g. Reaching Net Zero in 2050

Illustration of GHG emissions decrease over time



# E.g. Reaching Net Zero in 2050

Illustration of GHG emissions decrease over time



1. **Avoid & Reduce carbon emissions**

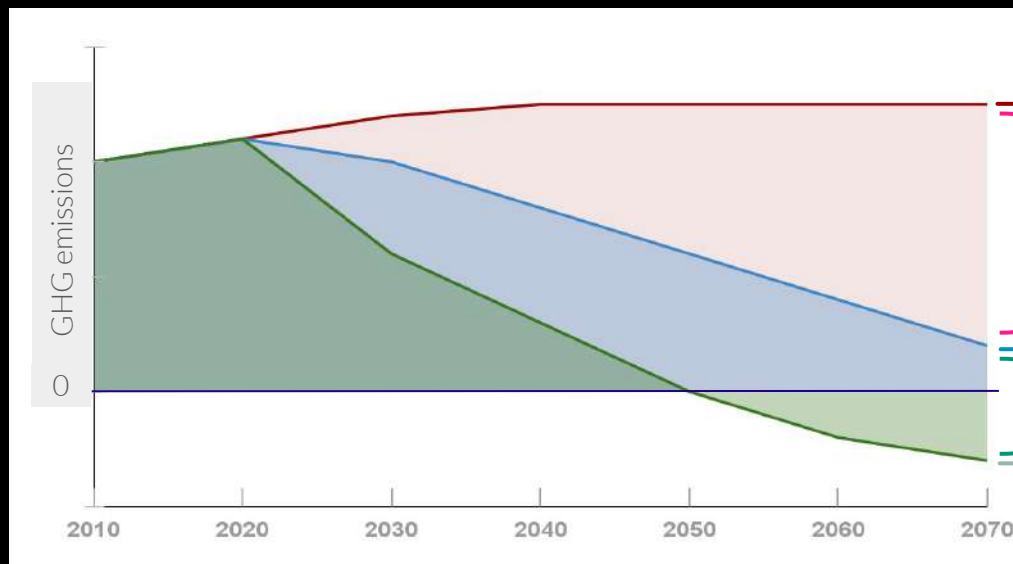
Business as usual

Carbon reduction levels

Gross emissions > 0

# E.g. Reaching Net Zero in 2050

Illustration of GHG emissions decrease over time



1. Avoid & Reduce carbon emissions

Business as usual

Carbon reduction levels

Gross emissions > 0

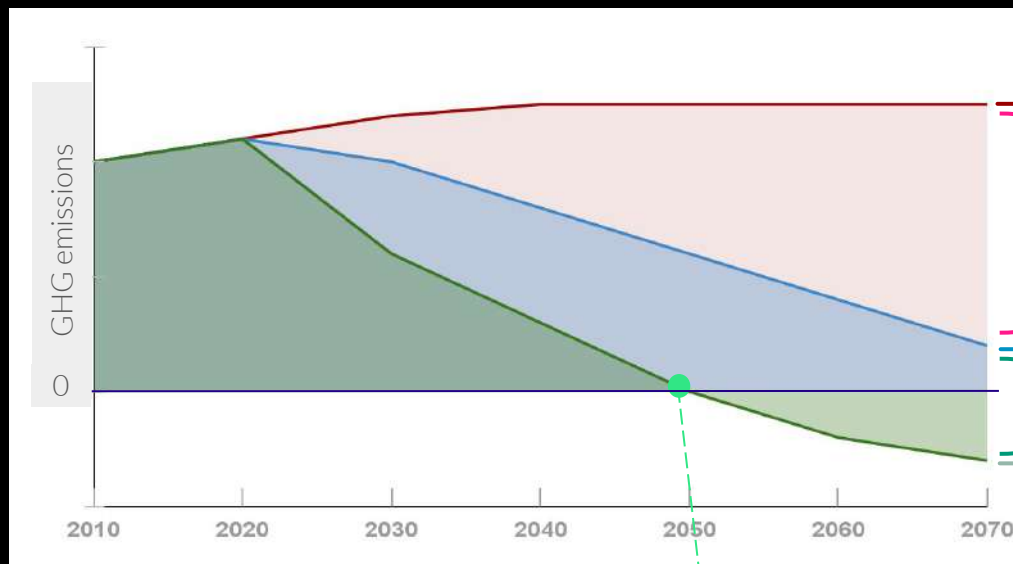
Carbon compensation levels

Net emissions < 0

2. Compensate residual emissions

# E.g. Reaching Net Zero in 2050

Illustration of GHG emissions decrease over time



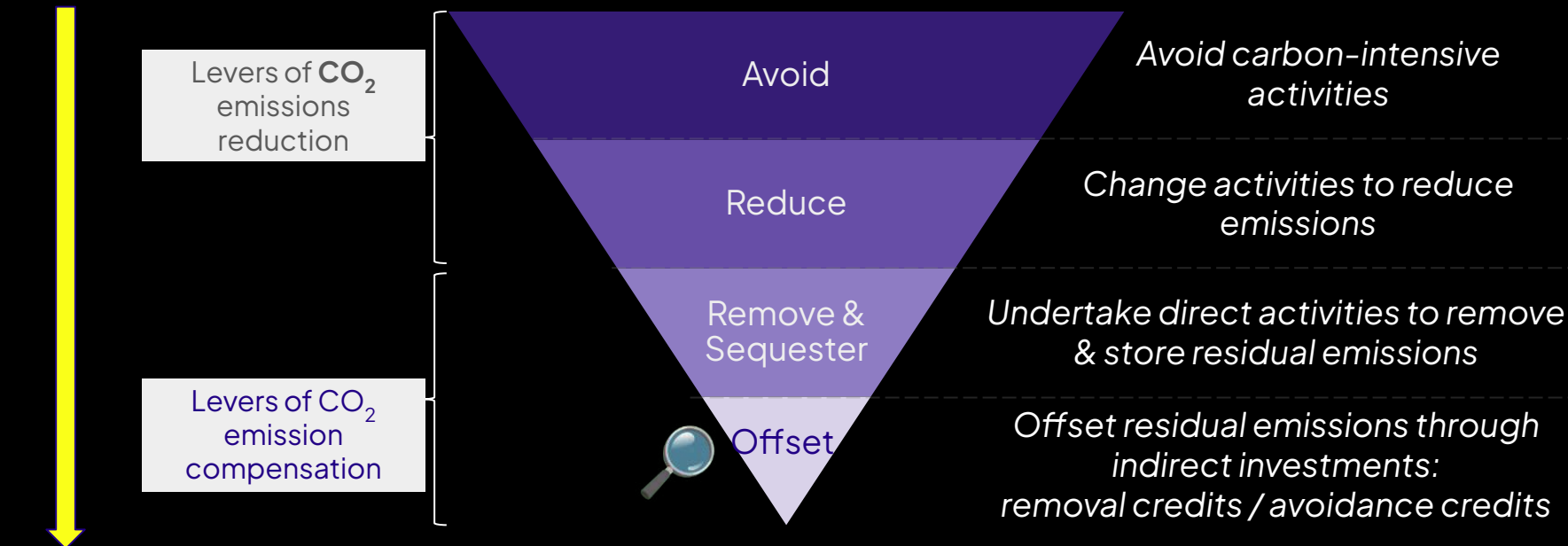
1. Avoid & Reduce carbon emissions

2. Compensate residual emissions

3. Reach Net Zero

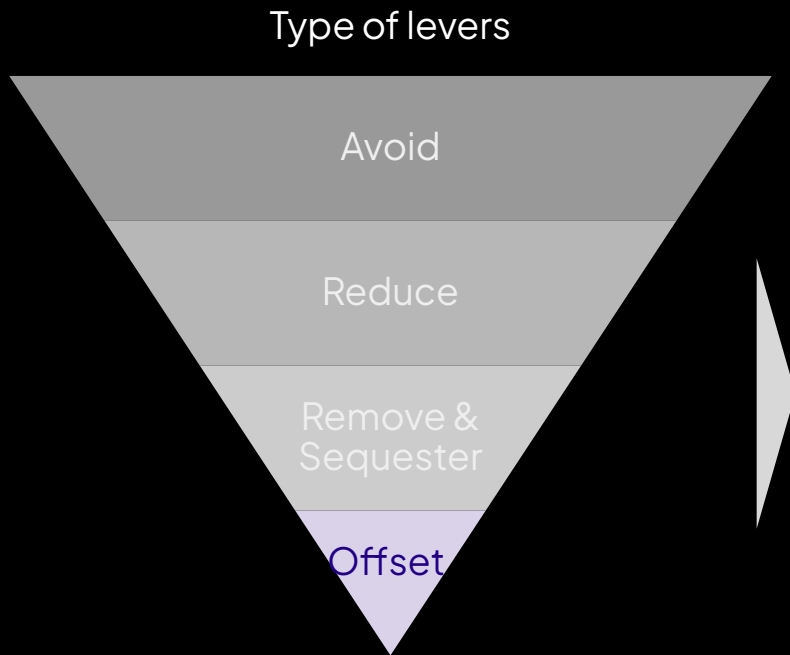
# Overview of decarbonization levers

*Most favored*



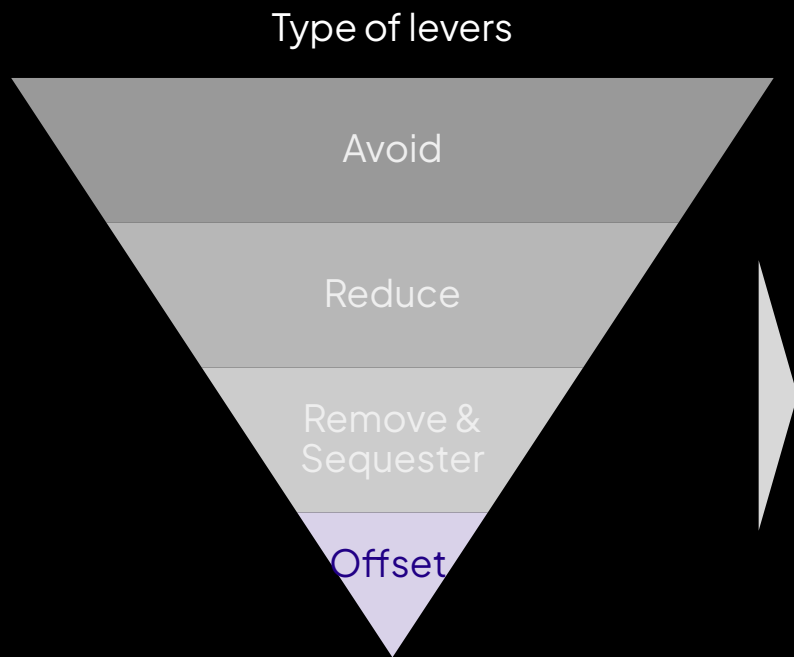
*Least favored*

# Offset principles



| Removal credits                                                                                                                                                                                                | Avoidance credits                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Pulls existing carbon out of the atmosphere</p>                                                                                                                                                             | <p>Reduces future emissions by preventing their release into the atmosphere</p>                                                                                                                                                   |
| <div> Tree growth</div> <div> DACS</div> | <div> Grassland conversion</div> <div> Timber harvest</div> |

# Offset principles



**1**  
**Transparency**

**2**  
**Alignment**

**3**  
**Additionality**

**4**  
**Verifiability**

**5**  
**Leakage-Free**

**6**  
**Double  
Counting**

**7**  
**Acceptability**

**8**  
**Durability**

**9**  
**Cut-off**



# Long term ambitions

Least impact on GHG emissions reduction



1

Carbon neutral →  Scopes 1&2 by 2040

2

Net Zero carbon →  Scopes 1&2 by 2039

3

Carbon negative →  by 2030

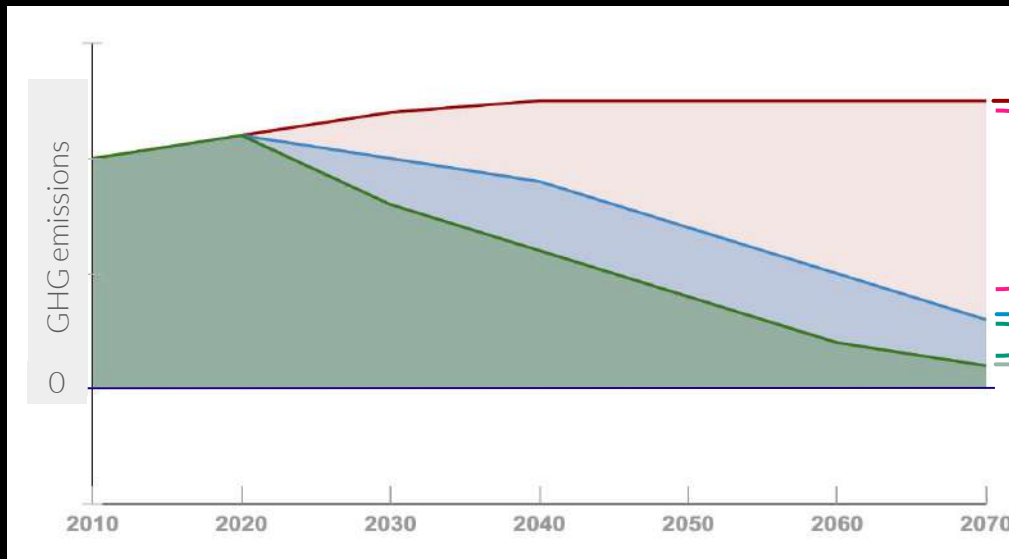
4

Zero carbon → 

Most impact on GHG emissions reduction

# Long term ambitions

## 1 Carbon neutral



Business as usual

Carbon reduction levels

Gross emissions > 0

Carbon compensation levels

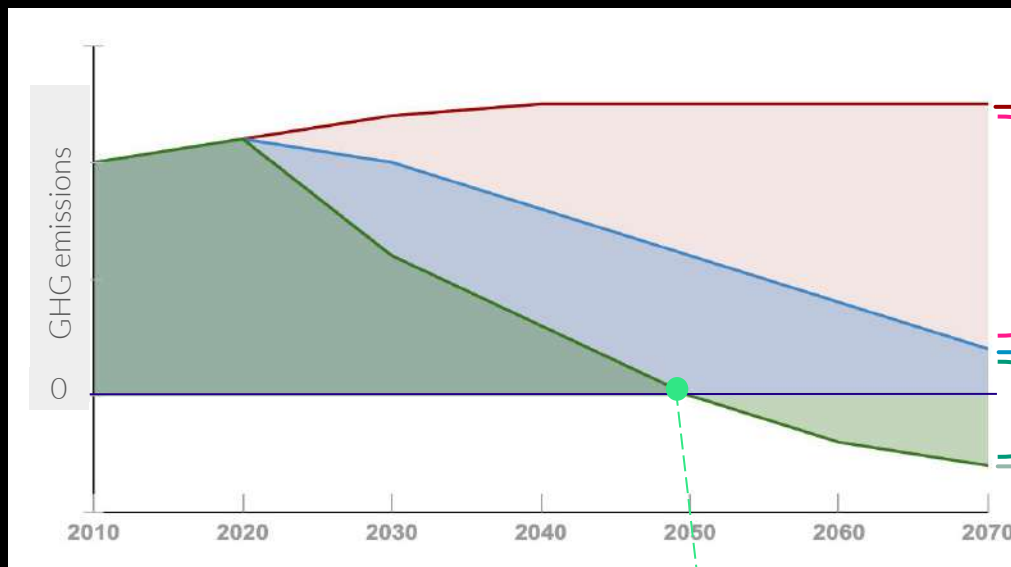
Net emissions > 0

1. Avoid & Reduce carbon emissions

2. Compensate residual emissions

# Long term ambitions

## 2 Net Zero carbon



1. Avoid & Reduce carbon emissions

Business as usual

Carbon reduction levels

Gross emissions > 0

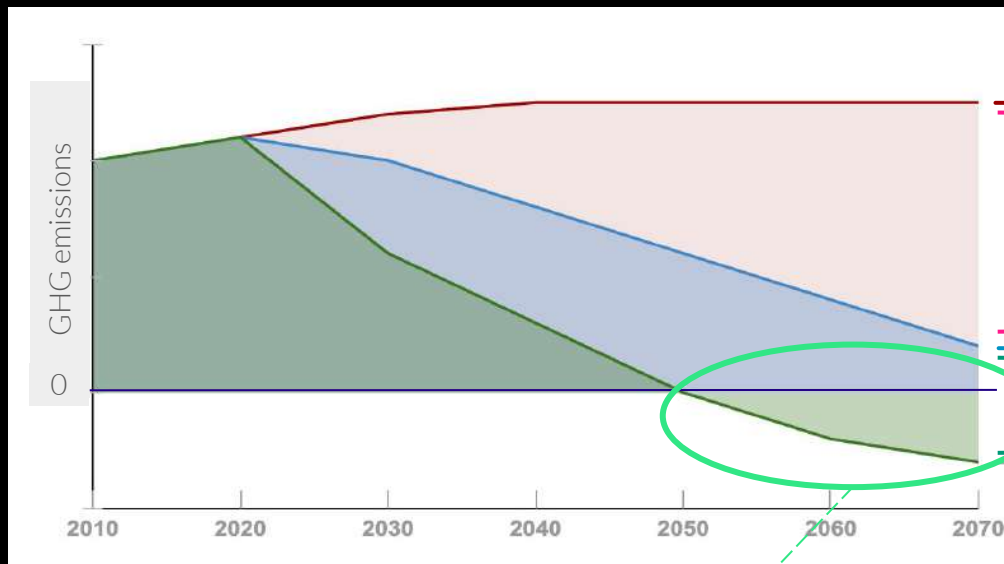
Carbon compensation levels

Net emissions < 0

2. Compensate residual emissions

# Long term ambitions

## 3 Carbon negative



1. Avoid & Reduce carbon emissions

Business as usual

Carbon reduction levers

Gross emissions > 0

Carbon compensation levers

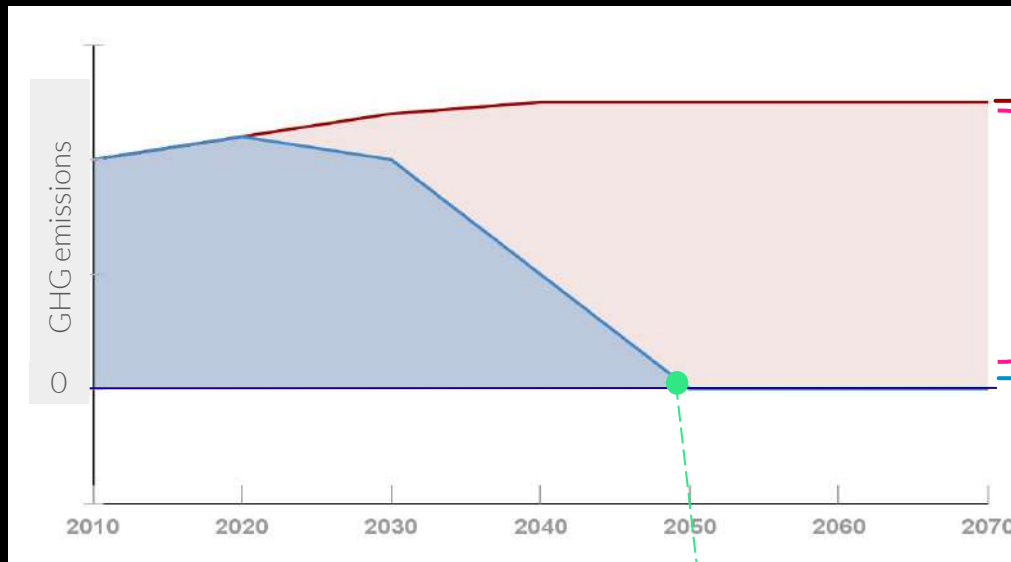
Net emissions < 0

2. Compensate residual emissions

Carbon negative

# Long term ambitions

## ④ Zero Carbon



1. Avoid & Reduce carbon emissions

Business as usual

Carbon reduction levers

Gross emissions = 0

Carbon Zero

# Overview of decarbonization levers

Least complex  
to implement



Most complex  
to implement

- 1 Carbon Neutral
- 2 Net Zero
- 3 Carbon negative
- 4 Zero carbon

| Avoid                             | Reduce                                | Remove                                                             | Offset                                                 |
|-----------------------------------|---------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------|
| Avoid carbon-intensive activities | Change activities to reduce emissions | Undertake direct activities to remove and store residual emissions | Offset residual emissions through indirect investments |
|                                   |                                       |                                                                    |                                                        |
|                                   |                                       |                                                                    | —                                                      |
|                                   |                                       |                                                                    | —                                                      |
|                                   | —                                     | —                                                                  | —                                                      |

# Review of the XRPL's carbon footprint



**Digital technology can both be  
a problem and a solution**



# Globally, the digital sector emits ~4% of greenhouse gas emissions

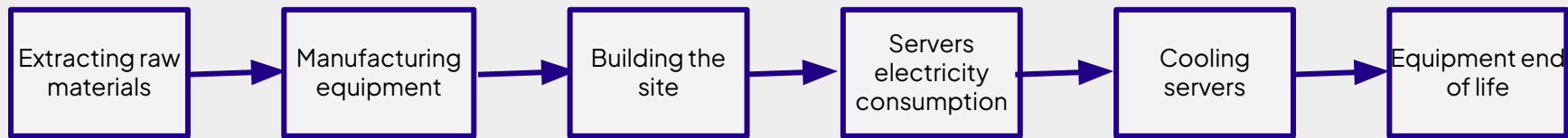
1

**Manufacturing** this equipment generates  
**40%** of GHGs

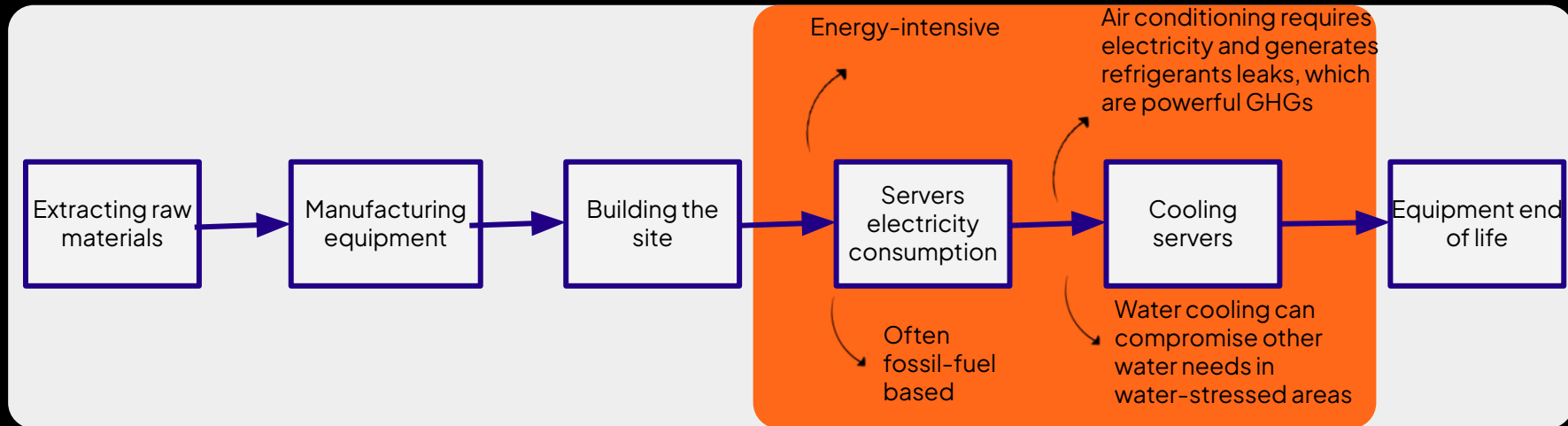
2

**Powering** this equipment generates  
**60%** of GHGs

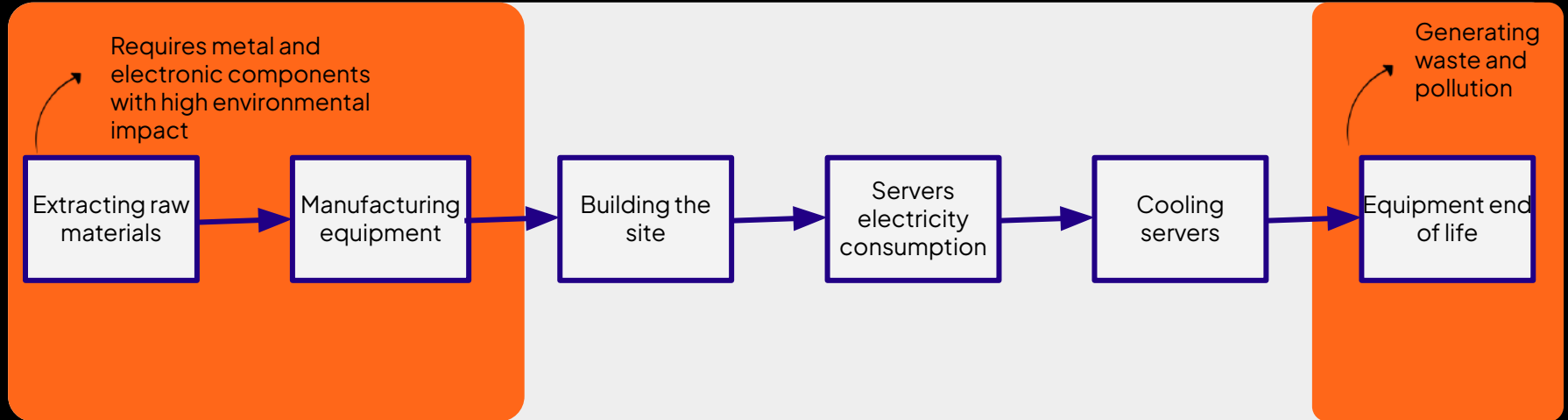
# Let's have a look at the blockchain value chain



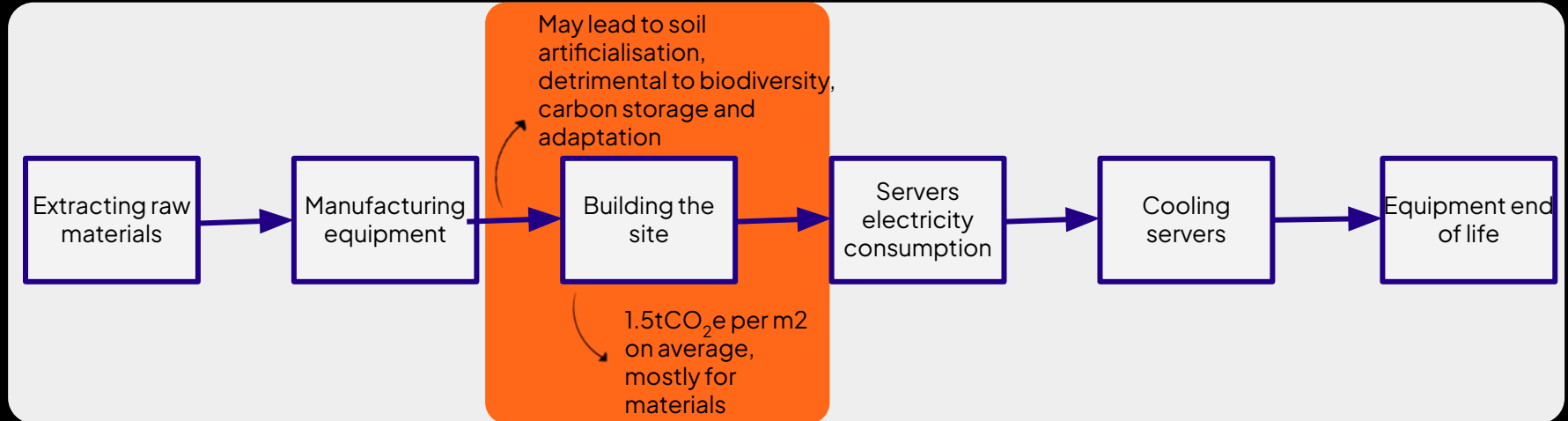
# Running servers requires a lot of electricity and water



# Server manufacturing and end-of-life are also impactful



# As well as building sites to host activity



# Why is it important to assess XRPL's carbon footprint?



## Differentiator

Energy efficiency as key decision criteria



## Mitigation

Starting point to achieve climate goals via energy reduction/offsetting strategies



## Transparency

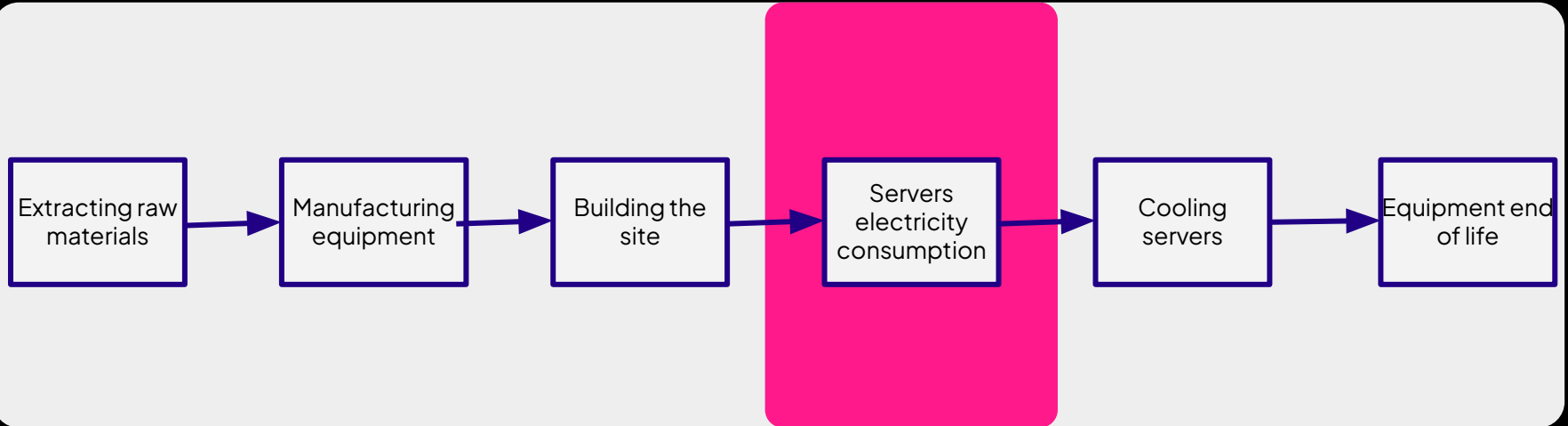
Vital to inform users, regulators, policymakers, and the public about the climate costs and benefits of XRPL



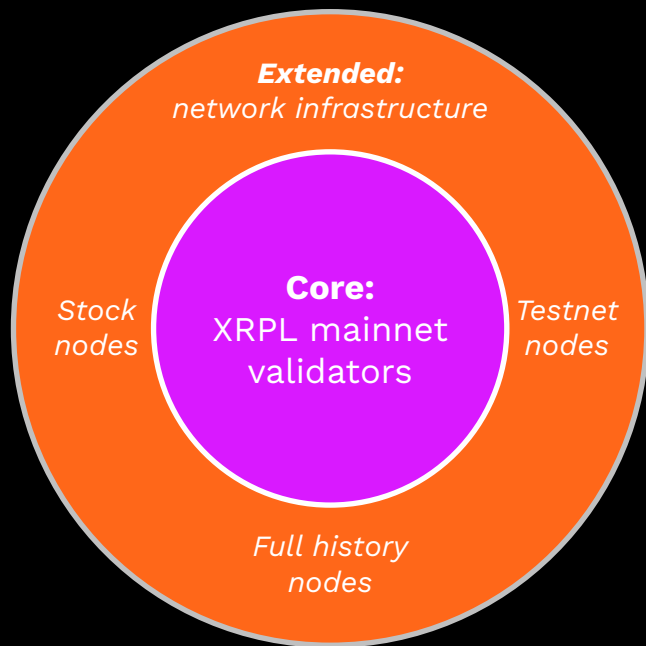
## Regulation

Compliance with EU MiCA and sustainability disclosure mandate

# Scope of XRPL assessment - Emission sources



# Scope of XRPL assessment - Core & Extended

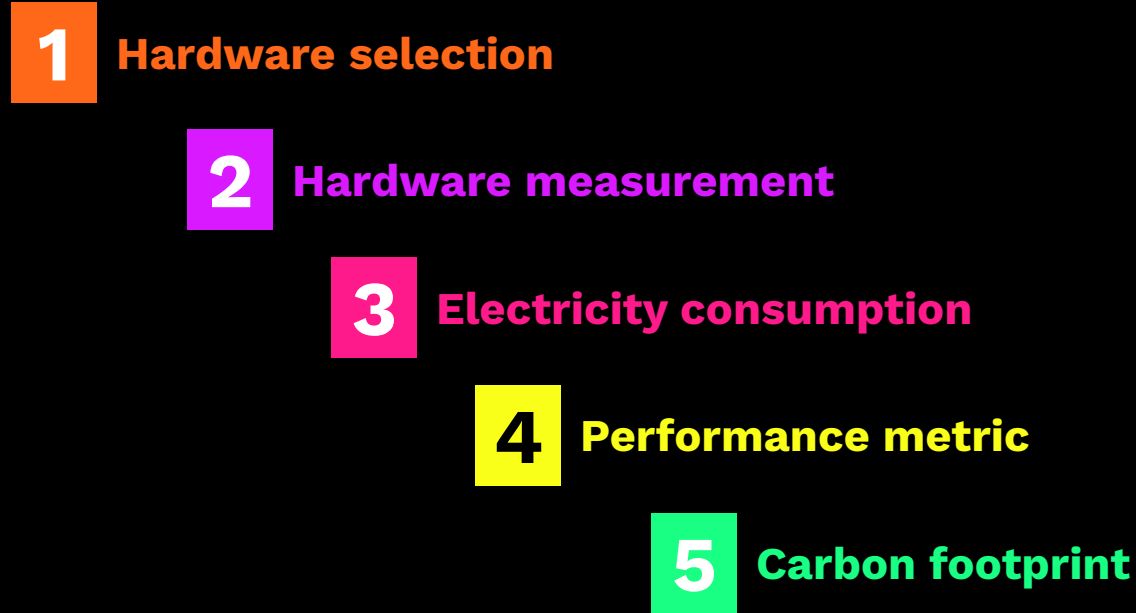


**Results in tCO<sub>2</sub>**  
(annualized)

|          |                         |                                                                                                      |
|----------|-------------------------|------------------------------------------------------------------------------------------------------|
| Core     | Validators (127)        | Vital for network core functionality<br>Standard for network comparisons<br>Focus of MiCA indicators |
|          | Stock nodes             | Part of XRPL carbon footprint                                                                        |
|          | Full history nodes (26) |                                                                                                      |
| Extended | Testnet nodes (113)     |                                                                                                      |



# Our methodology to assess network carbon emissions



[Link to  
Dashboard](#)

# Identification of decarbonization levers



# Identification of decarbonization levers

- Server's electricity consumption
- Cooling servers
- Infra. manufacturing
- Infra. end of life
- Validator sites
- ....



|            | Avoid                                    | Reduce                                       | Remove                                                                    | Offset                                                        |
|------------|------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|
|            | <i>Avoid carbon-intensive activities</i> | <i>Change activities to reduce emissions</i> | <i>Undertake direct activities to remove and store residual emissions</i> | <i>Offset residual emissions through indirect investments</i> |
| Priority 1 |                                          |                                              |                                                                           |                                                               |
| Priority 2 |                                          |                                              |                                                                           |                                                               |
| Priority 3 |                                          |                                              |                                                                           |                                                               |

# Definition of the offsetting strategy



# Key principles for offsetting

1

Transparency

2

Alignment

3

Additionality

4

Verifiability

5

Leakage-Free

6

Double  
Counting

...Others?

7

Acceptability

8

Durability

9

Cut-off

# Key takeaways & next steps

