# Municipal Circular Land Tenders

## How do they affect real estate developers?

06 – 07 – 2020

Sybren van der Velde

Management in the Built Environment

# Contents

# Linear Economy

Take | Make | Use | Waste

# Take

Make

Use

Waste

# Make

Take

Use

Waste

# Use

Take

Make

Waste

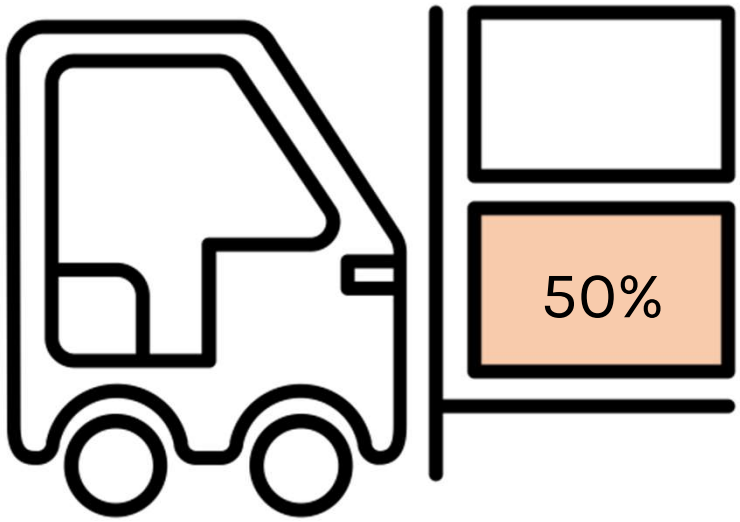
# Waste

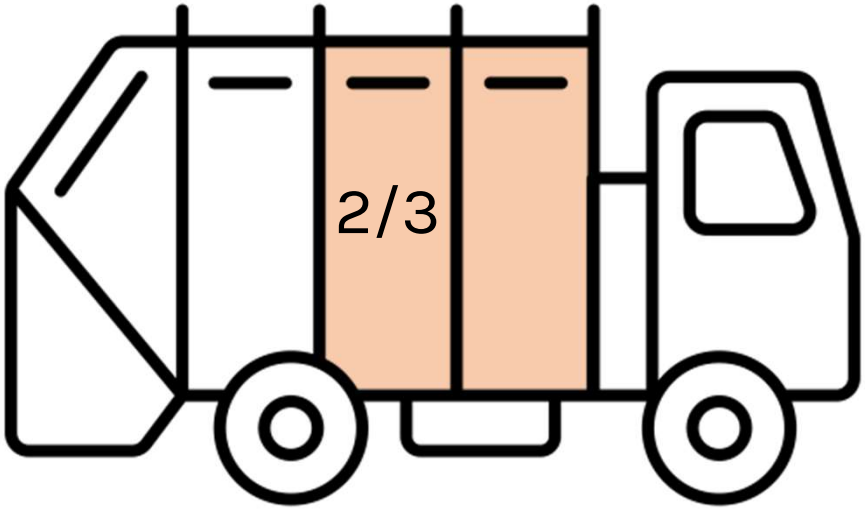
Take

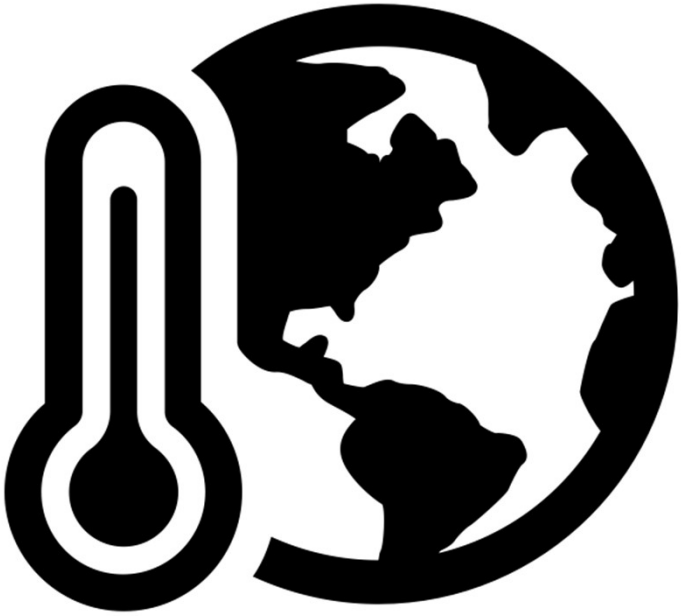
Make

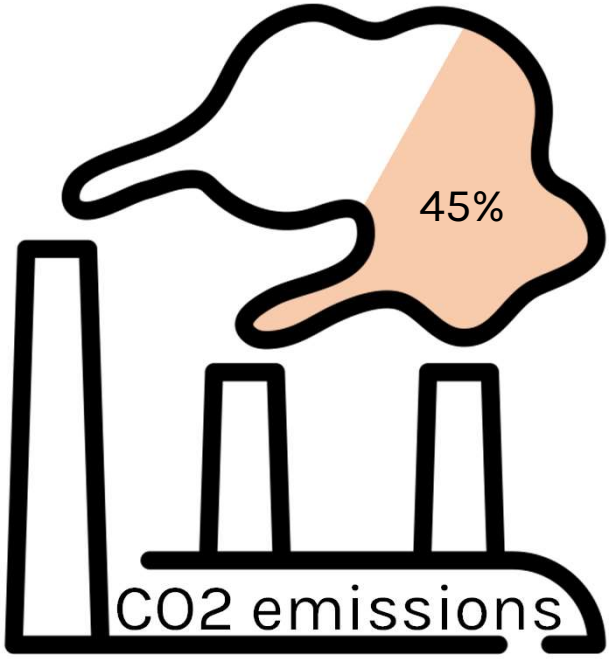
Use

# Construction industry






45%
CO2 emissions

# Circular Economy

Collect | Make | Use | Collect

# Collect

Make

Use

Collect

# Make

Collect

Use

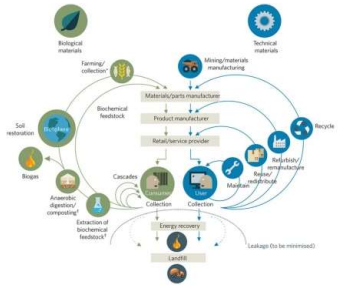
Collect

# Use

Collect | Make | Collect

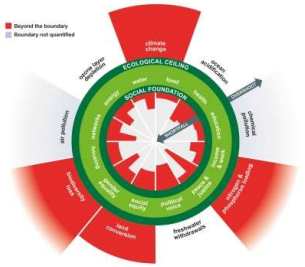
# Collect

Collect | Make | Use



Ellen MacArthur

Eva Gladek



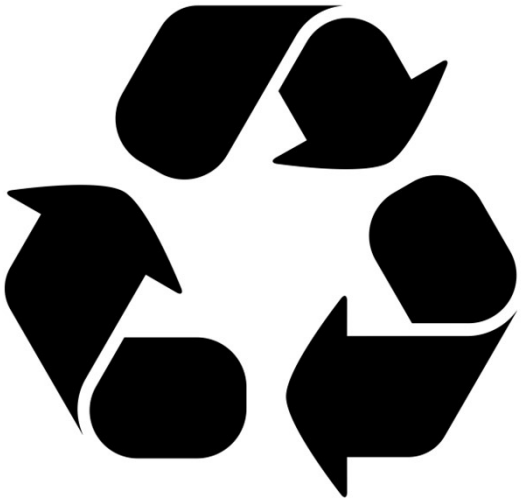
Kate Raworth

# 114 Definitions

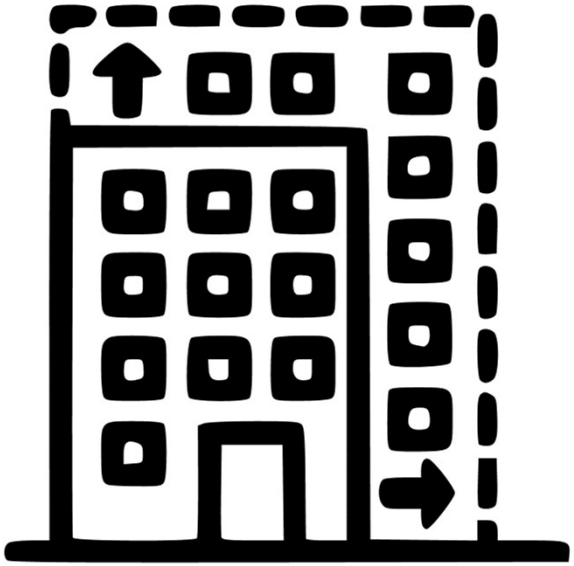
Most include:

“Reuse” & “Recycle”

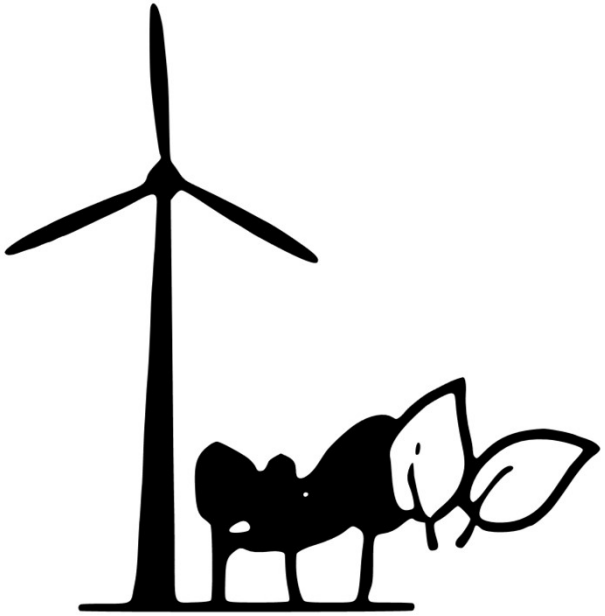
# Circular cities



Looping

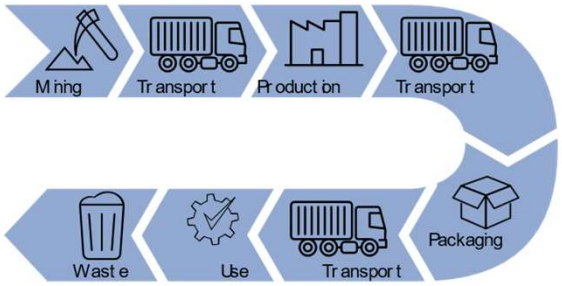


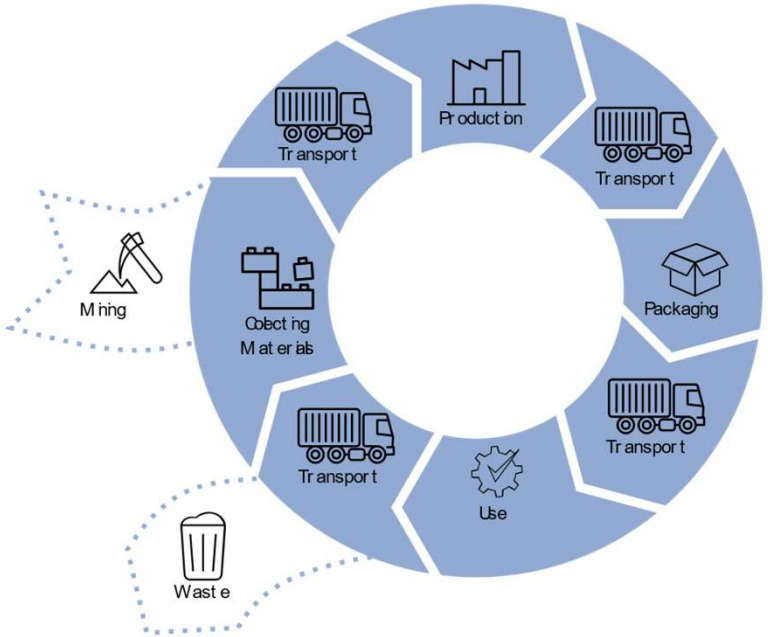
Adapting



Regeneration

Williams (2019)


Mining
Transport
Production
Transport
Packaging
Transport
Use
Waste


Mining
Collecting Materials
Transport
Production
Transport
Packaging
Transport
Use
Transport
Waste

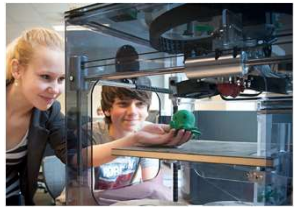
# Policy

## International


2050

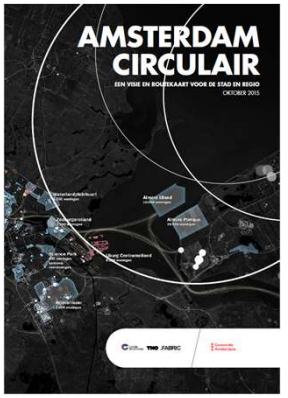
## National

Nederland circulair in 2050



2050

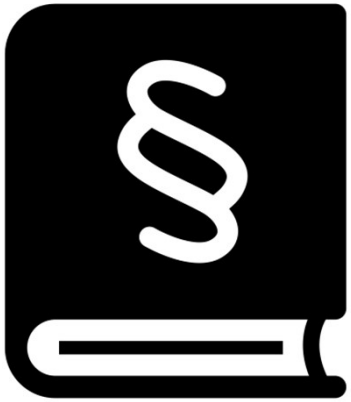
## Municipal



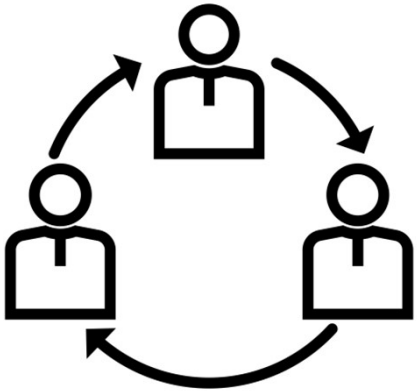


2050

# Policy implementation

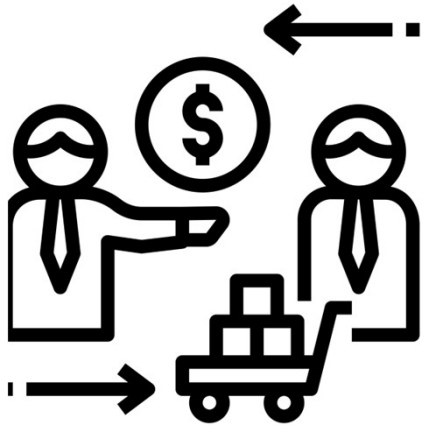


Legislation



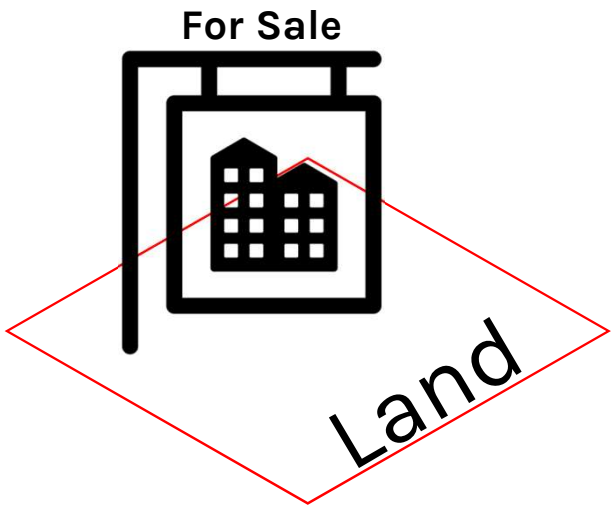
Collaboration

20% GDP



Procurement

# Land tendering

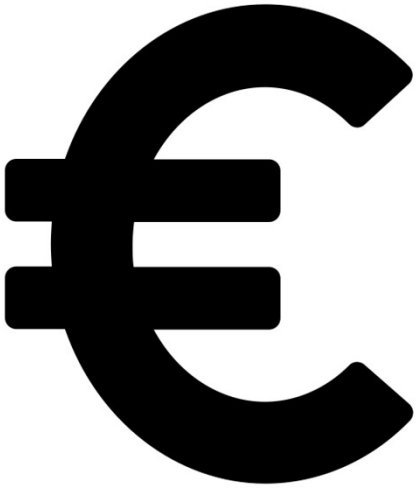



Tender request

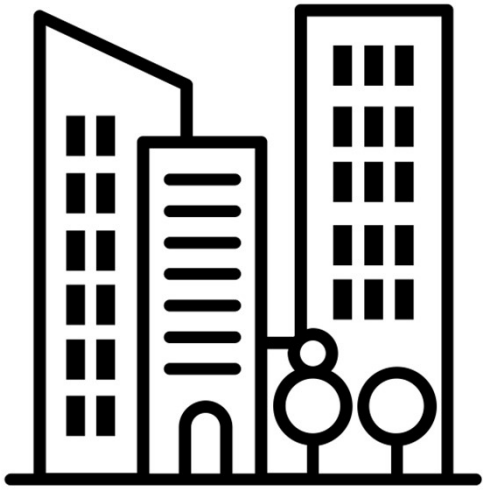
- 123 $m^2$
- Housing, offices, etc.
- Sustainable

Tender proposal

# Selection



Price



Quality

# Research question

*How can tender requests be improved to pursue municipal circular building goals in land tendering?*

# Research design

Literature study

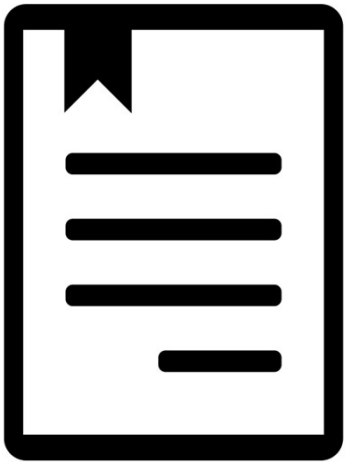
Case study

Recommendations

# Case studies

| Amsterdam: Kop Zuidas | Amsterdam: Centrumeiland | Rotterdam: Delftseplein | Utrecht: HUQ |
|---|---|---|---|
| 24.000 $m^2$ | 7.500 $m^2$ | 41.000 $m^2$ | 70.000 $M^2$ |
| - Offices<br>- Amenities<br>- Housing<br>- Parking | - Housing<br>- Amenities (social, offices)<br>- Parking | - Housing<br>- Offices<br>- Hotel possibility<br>- Sharing facilities | - Housing<br>- Commercial<br>- Cultural functions |
| 15% sustainability | 40 – 50% circularity | 30% sustainability | ~ 10% sustainability |
|  |  |  |  |

# Case studies



Policy

Tender request

Tender proposal

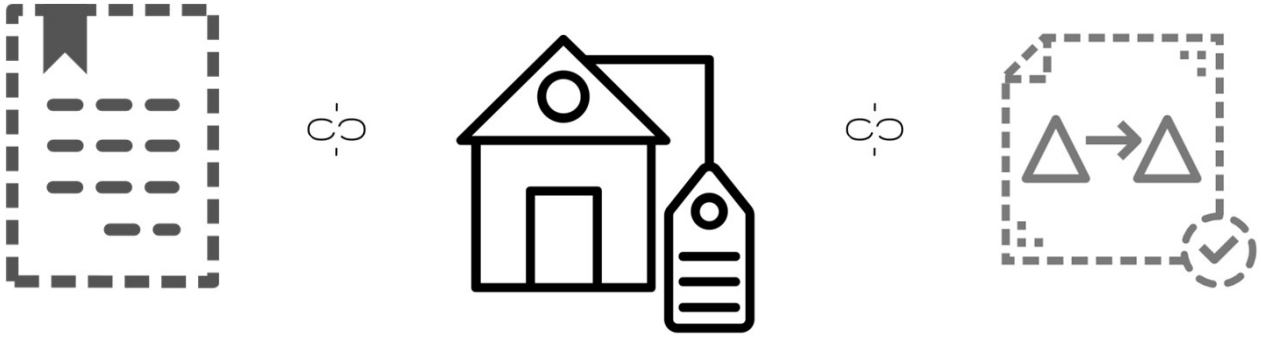
# Policy


- Only Amsterdam had specific policy
  - Too extensive
  - More guidelines necessary
- Other municipalities: motivation of officials
  - Policy can help to give support

Tender request

Tender proposal

# Policy



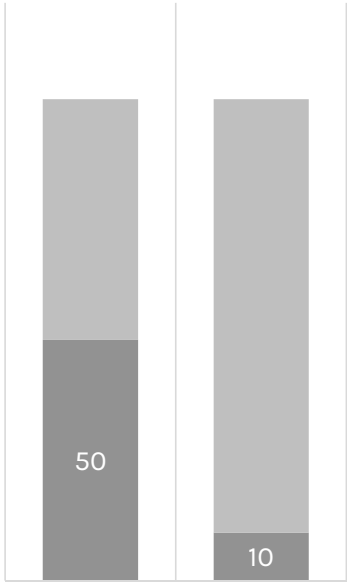
Weak link policy – tender - enforcement

Tender request

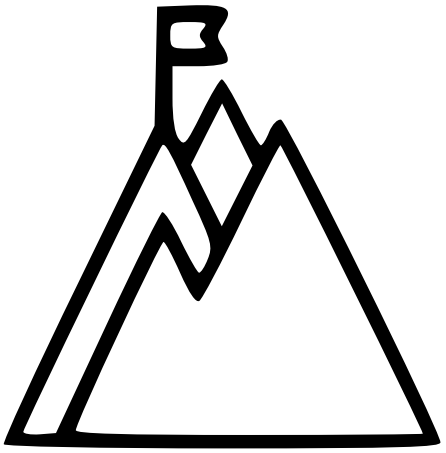
Tender proposal

# Tender request

Policy




50% Circularity
~ 10% Sustainability

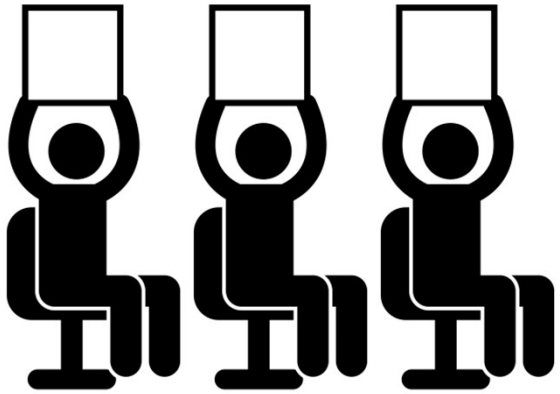


Clear or vague formulation of goals

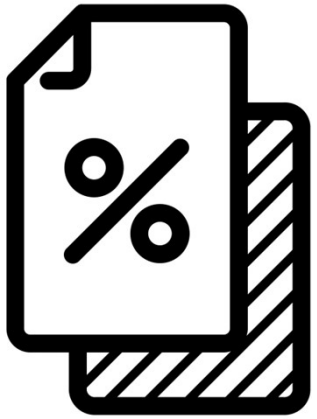
Tender proposal

# Tender request

Policy



Qualitative



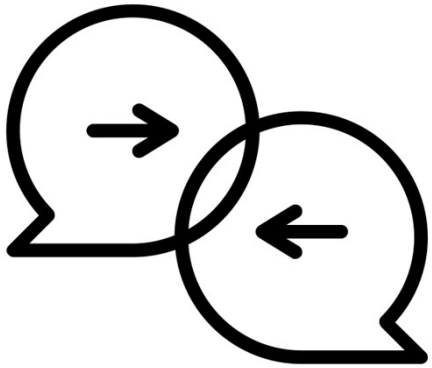
Quantitative

Tender proposal

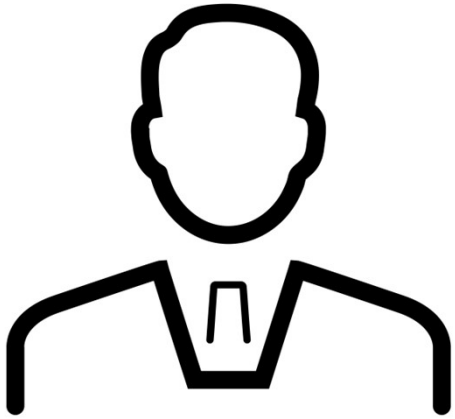
# Tender proposal

Policy

Tender request



Focus on criteria

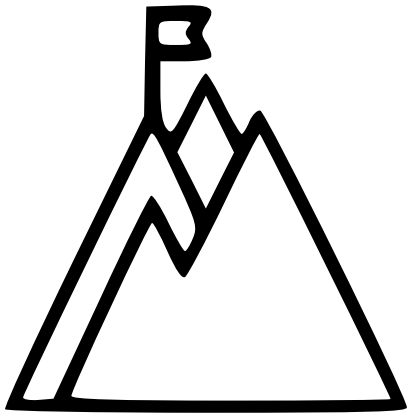


Hire consultants

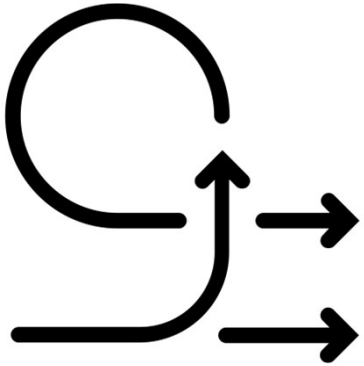
# Tender proposal

Policy

Tender request

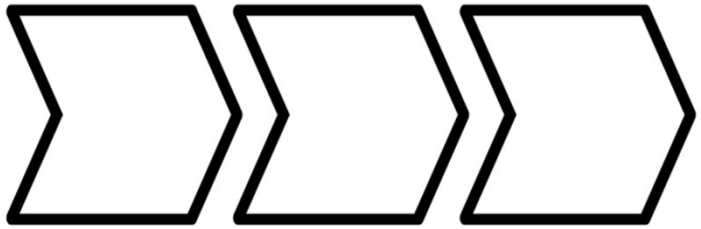


Want clearly defined goals



Need flexibility

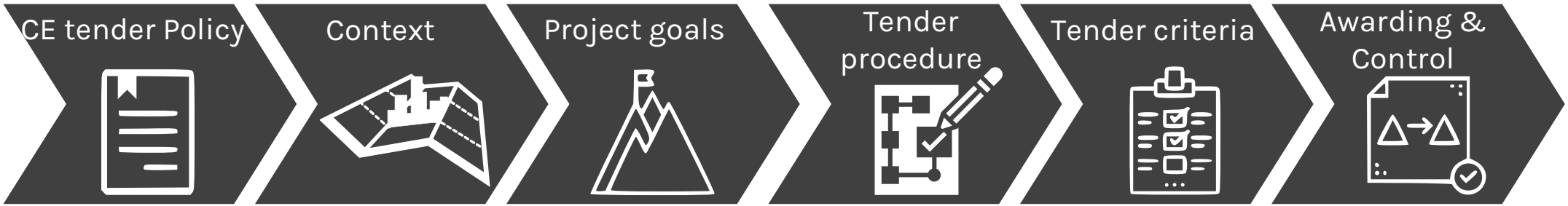
# Recommendations



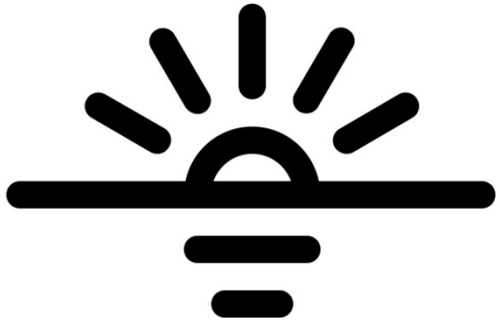
Process design

Tender criteria

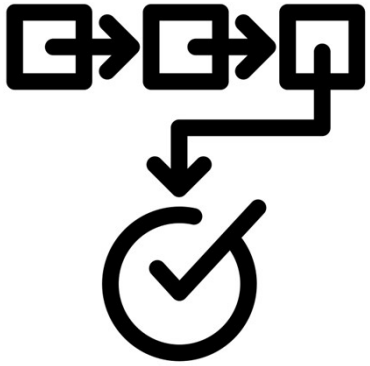
# Circular land tendering process



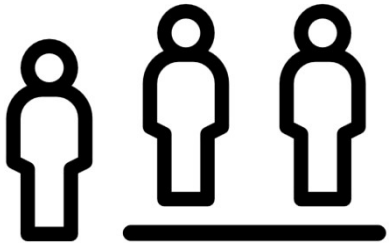
# CE tender policy



Define ultimate goal



Specific action plan



assign responsibilities

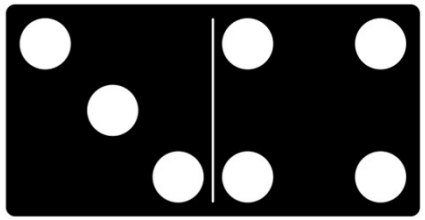
# Context

Land-use-plan

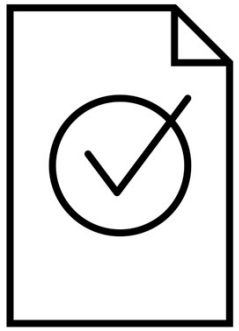
urban mining possibilities

infrastructure

# Project goals



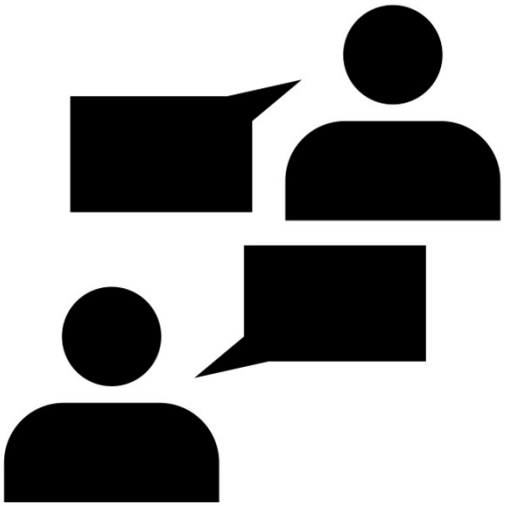
3 – 4 Goals



Minimum requirements

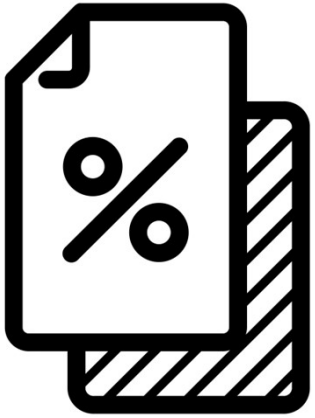
Awarding criteria

# Tender procedure

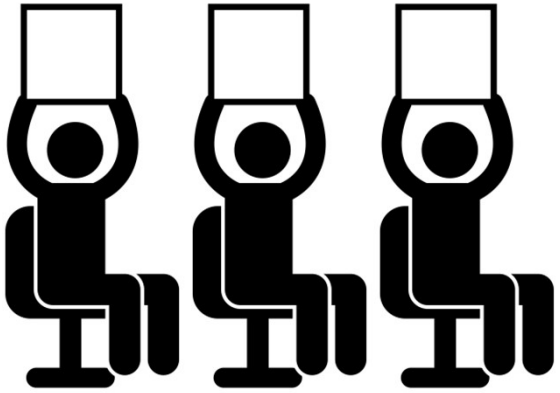


Dialogue

# Tender criteria



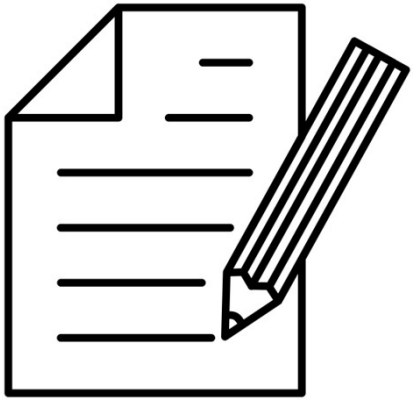
Quantitative



Qualitative

# Quantitative criteria

Require a lot of information



Used for contract

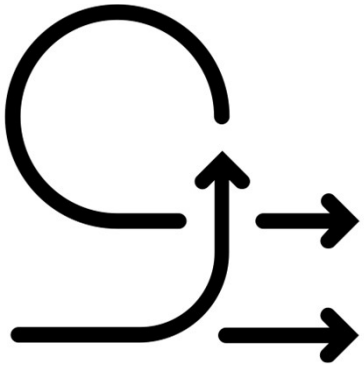


Qualitative

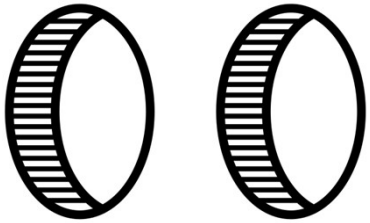
# Qualitative criteria



Quantitative

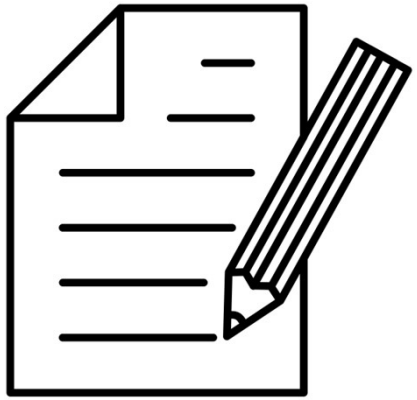


Allow flexibility



Difficult to make hard claims

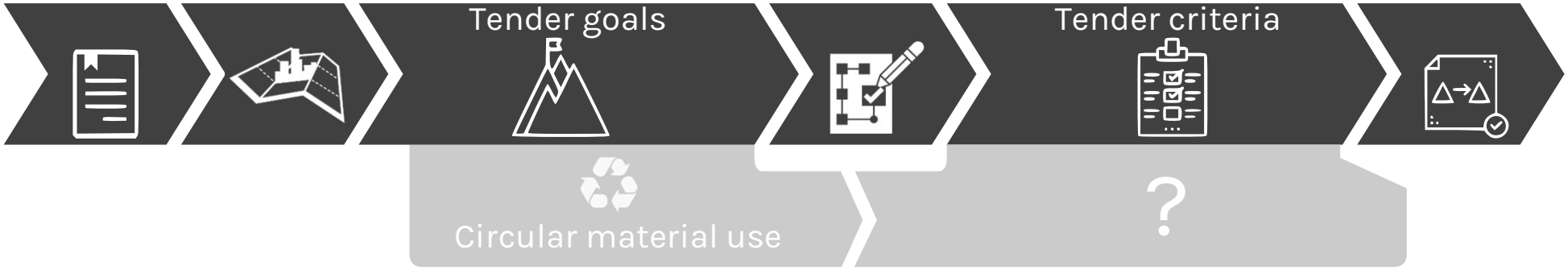
# Awarding & Control



Inspect

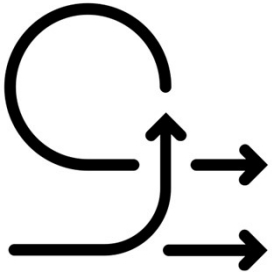
Verify

# Circular tender criteria



# Circular tender criteria


Quantitative



Flexible

Proportionate

# Circular materials

| R step | Definition |
|---|---|
| Reduce | Amount materials less than reference building (kg) |
| Rethink | Amount of bio-based materials used in building (kg) |
| Re-use | Elements / Components reused in building (kg) |
| Recycle | Recycled materials reused in building (kg) |

# Circular materials

| R step | Definition |
|---|---|
| Reduce | Amount materials less than reference building (kg) |
| Rethink | Amount of bio-based materials used in building (kg) |
| Re-use | Elements / Components reused in building (kg) |
| Recycle | Recycled materials reused in building (kg) |

$$\text{Score} = \frac{\text{Amount of circular materials}}{\text{GFA}_{m^2}}$$

# Circular materials

| Building 1 | | | Building 2 | | |
|---|---|---|---|---|---|
|  | | |  | | |
| | Material | kg | | Material | kg |
| R2 | Wood | 20 | R2 | Wood | 40 |
| | Bioplastics | 0 | | Bioplastics | 5 |
| Input Score building 1: $\frac{(20 * 0{,}6) + (R3 * \frac{F3}{m^2}) + (R4 * F4) + (R1 * F1)}{\text{BVO}} =$ | | | | | |
| Input Score building 2: $\frac{(45 * 0{,}6) + (R3 * \frac{F3}{m^2}) + (R4 * \mathrm{F4}) + (R1 * \mathrm{F1})}{\text{BVO}} =$ | | | | | |

| R | Definition | Factor |
|---|---|---|
| R1 | Reduce | F1 1,0 |
| R2 | Rethink | F2 0,6 |
| R3 | Re-use | F3 0,7 |
| R4 | Recycle | F4 0,5 |

# Circular materials

| Building 1 | | | Building 2 | | |
|---|---|---|---|---|---|
|  | | |  | | |
| | Material | kg | | Material | kg |
| R2 | Wood | 20 | R2 | Wood | 40 |
| | Bioplastics | 0 | | Bioplastics | 5 |
| R3 | Reused elements (e.g. doors) | 0 | R3 | Reused elements (e.g. doors) | 5 |

Input Score building 1: $\frac{(20 * 0{,}6) + (0 * 0{,}7) + (R4 * F4) + (R1 * F1)}{\frac{m^2}{\text{BVO}}} =$

Input Score building 2: $\frac{(45 * 0{,}6) + (10 * 0{,}7) + (R4 * \text{F4}) + (R1 * \text{F1})}{\frac{m^2}{\text{BVO}}} =$

| R | Definition | Factor |
|---|---|---|
| R1 | Reduce | F1 1,0 |
| R2 | Rethink | F2 0,6 |
| R3 | Re-use | F3 0,7 |
| R4 | Recycle | F4 0,5 |

# Circular materials

| Building 1 | | | Building 2 | | |
|---|---|---|---|---|---|
|  | | |  | | |
| | Material | kg | | Material | kg |
| R2 | Wood | 20 | R2 | Wood | 40 |
| | Bioplastics | 0 | | Bioplastics | 5 |
| R3 | Reused elements (e.g. doors) | 0 | R3 | Reused elements (e.g. doors) | 5 |
| R4 | Recycled concrete | 5 | R4 | Recycled concrete | 30 |

Input Score building 1: $\frac{(20 * 0{,}6) + (0 * 0{,}7) + (5 * 0{,}5) + (R1 * F1)}{\frac{m^2}{\text{BVO}}} =$

Input Score building 2: $\frac{(45 * 0{,}6) + (10 * 0{,}7) + (30 * 0{,}7) + (R1 * F1)}{\frac{m^2}{\text{BVO}}} =$

| R | Definition | Factor |
|---|---|---|
| R1 | Reduce | F1 1,0 |
| R2 | Rethink | F2 0,6 |
| R3 | Re-use | F3 0,7 |
| R4 | Recycle | F4 0,5 |

# Circular materials

| Building 1 | | | Building 2 | | |
|---|---|---|---|---|---|
|  | | |  | | |
| | Material | kg | | Material | kg |
| R2 | Wood | 20 | R2 | Wood | 40 |
| | Bioplastics | 0 | | Bioplastics | 5 |
| R3 | Reused elements (e.g. doors) | 0 | R3 | Reused elements (e.g. doors) | 5 |
| R4 | Recycled concrete | 5 | R4 | Recycled concrete | 30 |
| | Steel | 30 | | Steel | 20 |
| | Concrete | 40 | | Concrete | 15 |
| | Plastics | 5 | | Plastics | 5 |
| R1 | Total | 100 | R2 | Total | 120 |

Input Score building 1: $\frac{(20 * 0{,}6) + (0 * 0{,}7) + (5 * 0{,}5) + (0 * 1{,}0)}{\frac{m^2}{BVO}} = 14{,}5$

Input Score building 2: $\frac{(45 * 0{,}6) + (5 * 0{,}7) + (30 * 0{,}5) + (-20 * 1{,}0)}{\frac{m^2}{BVO}} = 25{,}5$

| R | Definition | Factor |
|---|---|---|
| R1 | Reduce | F1 1,0 |
| R2 | Rethink | F2 0,6 |
| R3 | Re-use | F3 0,7 |
| R4 | Recycle | F4 0,5 |

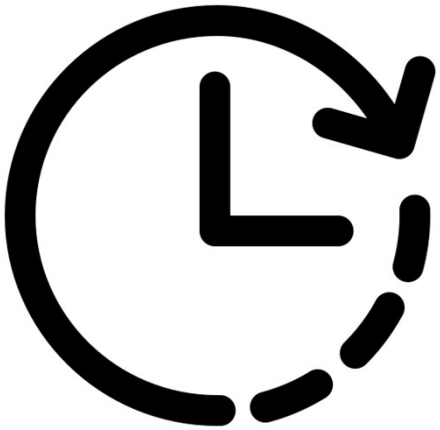
# Expert’s opinions

Positive

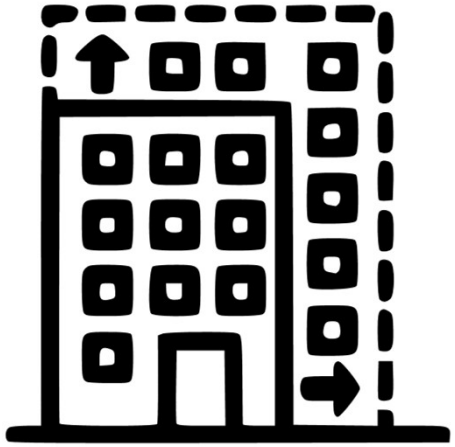

Needs definitions

Provide list of excluded materials

# Pathway for future criteria



Determine future value



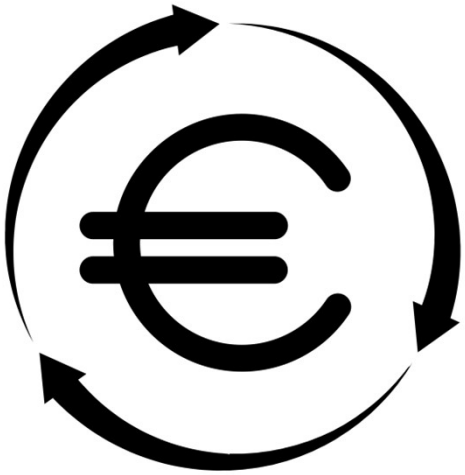
Measure other CE aspects

Implement & Evaluate

# Conclusion

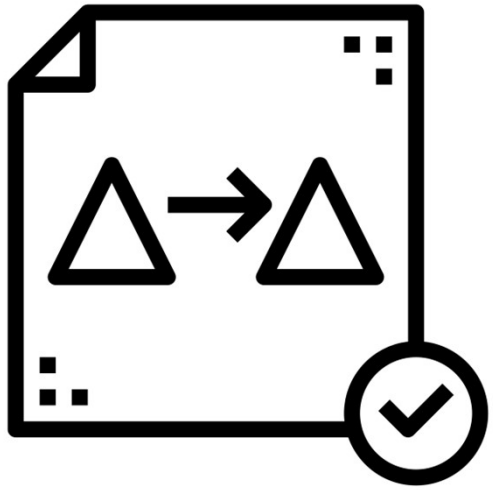
*How can tender requests be improved to pursue municipal circular building goals in land tendering?*

# Conclusion

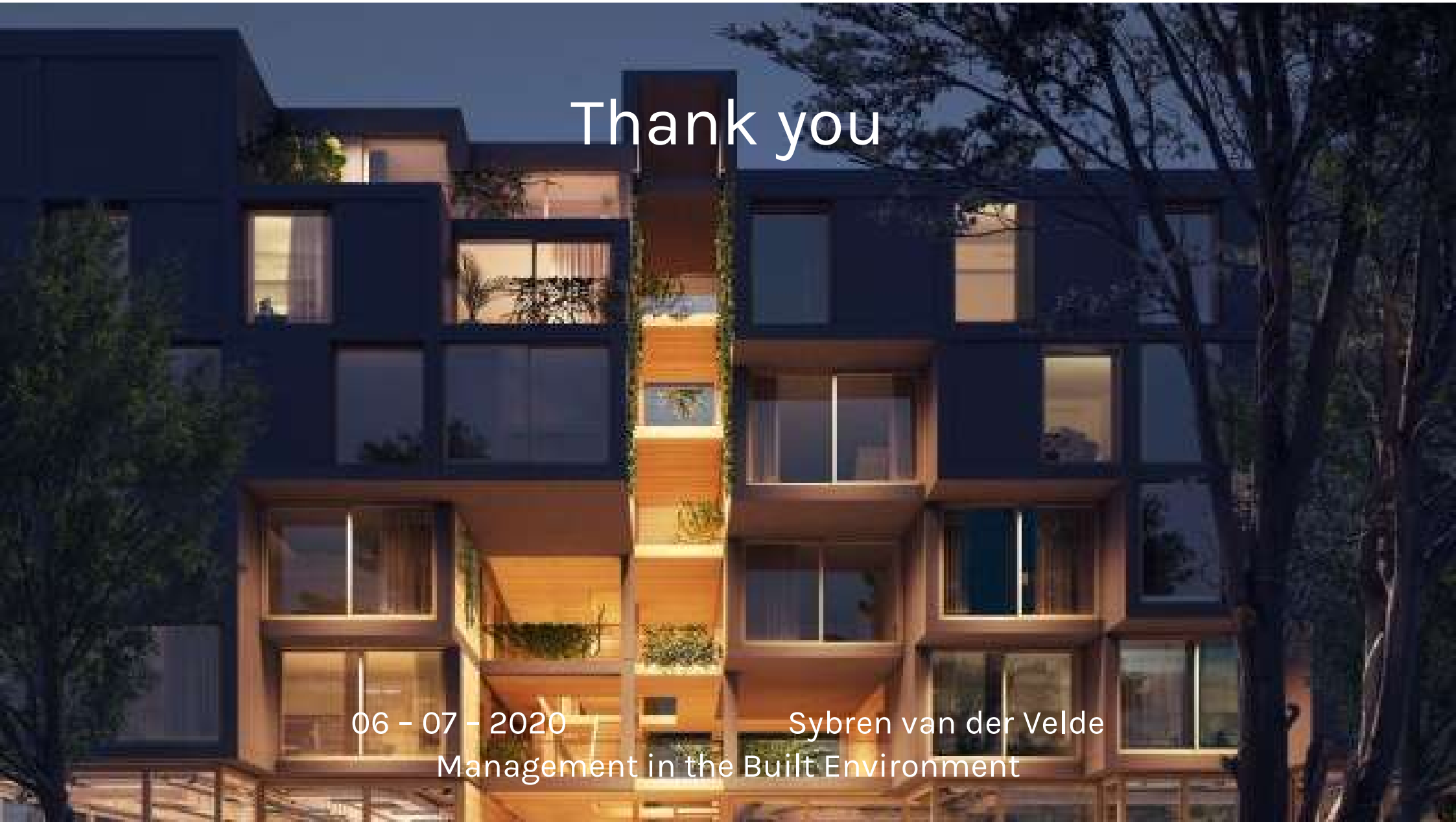


Define circular economy

Specific project goals



Check goal realisation



# Thank you

06 – 07 – 2020

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Management in the Built Environment