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MSc4 Graduation Laboratory AR3R010
21/06/2021

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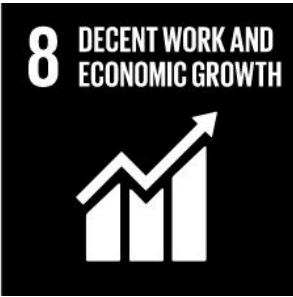
Internship supervisor

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Physics, Circularity and Integrated Sustainability



CIRCULAR SUPPLY CHAIN MANAGEMENT

The role of the municipality within circular supply chain collaboration to achieve upscaling of circular renovation of Dutch owner-occupied housing



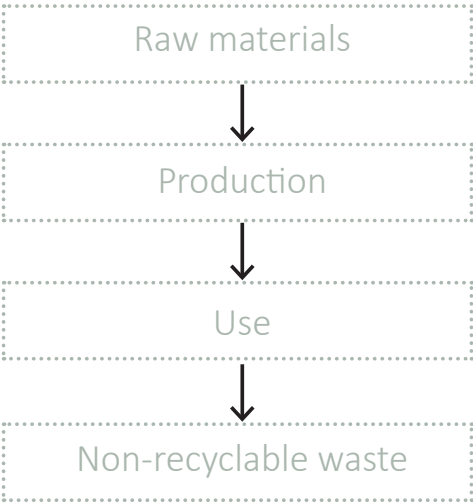


there is a need for ...

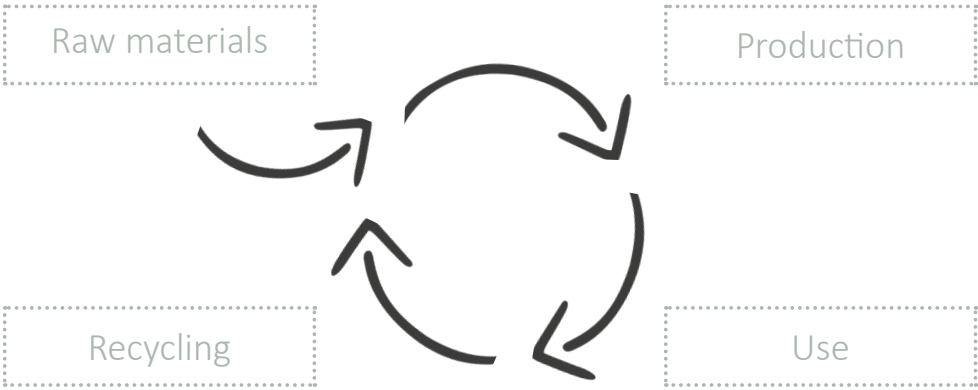


transformation towards a circular built environment

Linear economy



Circular economy





there is a need for ...



renovation of the existing building stock



Total housing stock in the Netherlands on 01/01/2020 (CBS, 2020)



Number of privately owned homes in the Netherlands on 01/01/2020 (CBS, 2020)

Row	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10
1	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
2	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
3	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
4	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
5	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
6	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
7	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
8	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
9	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray
10	Black	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray

there is a need for ...



collaboration within circular supply chains

CIRCULAR SUPPLY CHAIN COLLABORATION (CSCC)

“Connecting a network of actors in their supply chain by managing data transparency, material flows and exchanges, responsibilities, predictability and sharing of benefits.”

(Leising et al., 2018, p. 977)

making the world a better place



transformation
towards a circular economy



renovation
of the existing building stock



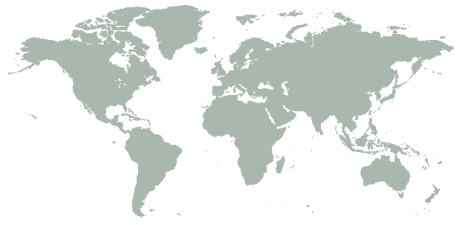
collaboration
within circular supply chains

TABLE OF CONTENTS

- Research approach
- State-of-the-art
- Theory and concepts
- Stakeholder analysis
- Conclusion
- Discussion

PROBLEM

- Collaboration within circular supply chain management



Global



Continental



National



Provincial



Municipal



Global



Continental



National



Provincial



Municipal

PROBLEM



GOAL

■ Collaboration within circular supply chain management

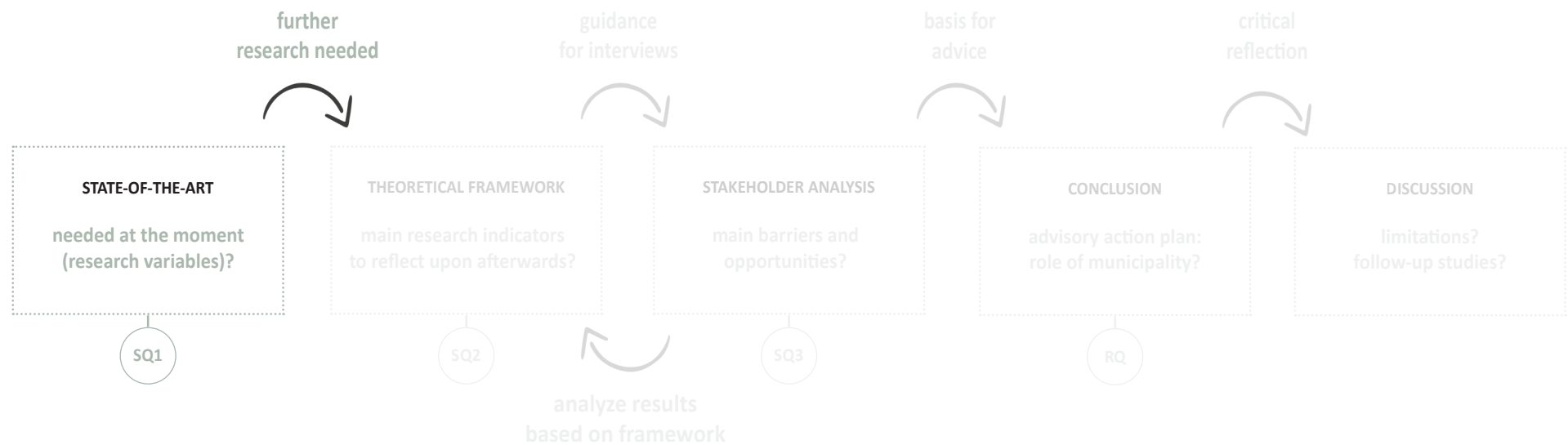
■ Advising the **municipality** on their position within (local) circular supply chain collaboration

RQ

*How could **CSCC be facilitated by municipalities** to achieve upscaling of circular renovation of Dutch owner-occupied housing?*

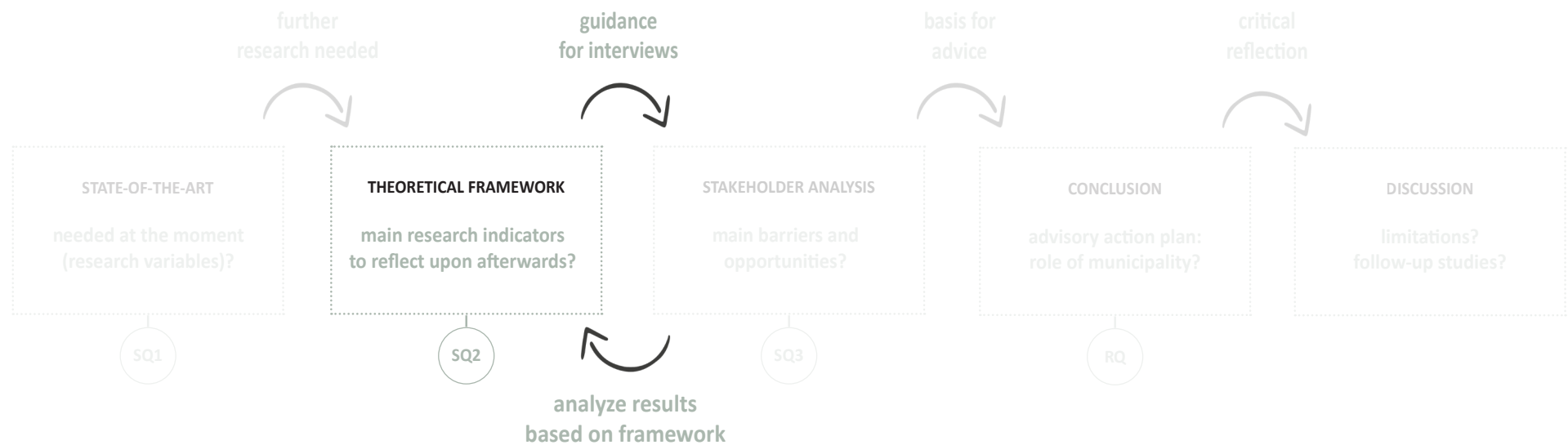
SQ1

What is the **state-of-the-art** of circular renovation of Dutch owner-occupied housing?



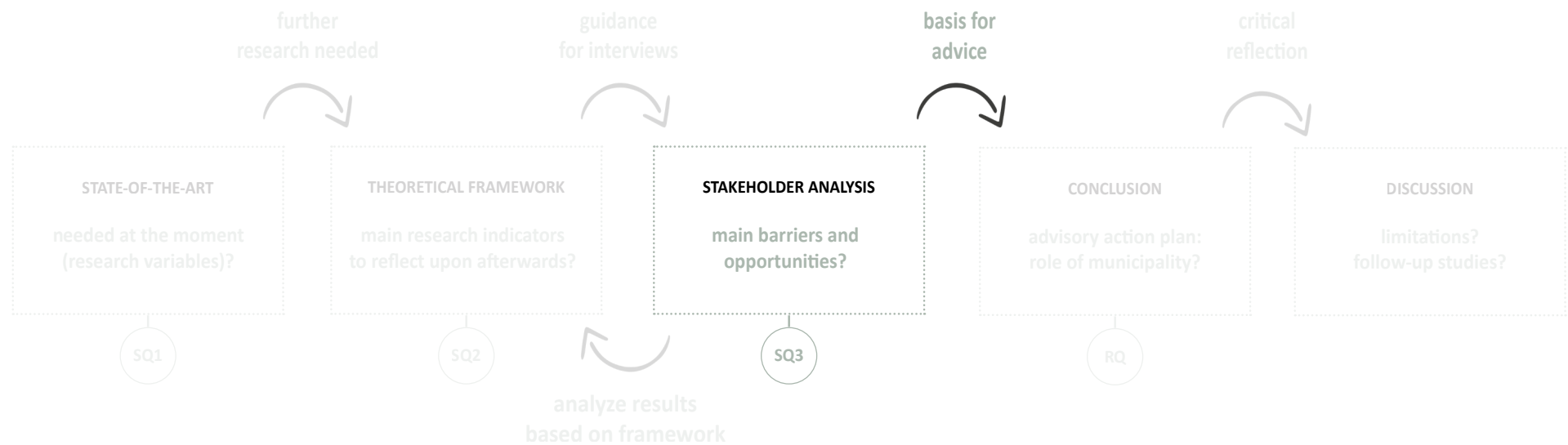
SQ2

Which factors are needed to **facilitate CSCC** according to literature?



SQ3

How do different actors of CSC networks see and experience the **role of the municipality** within CSCC to achieve upscaling of circular renovation of owner-occupied homes?



Interview phase 1

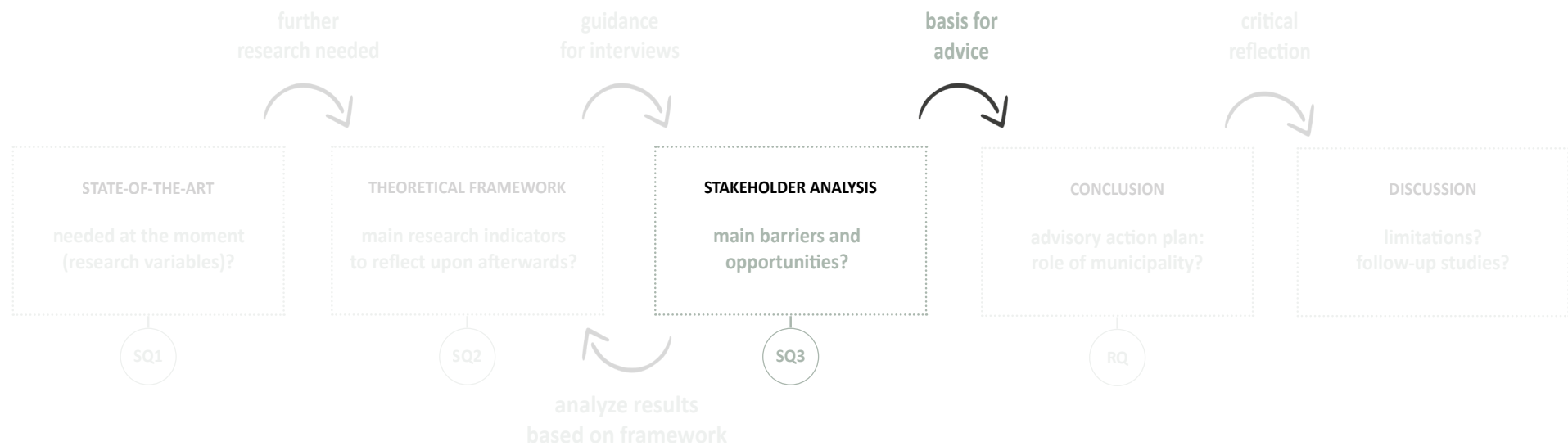
	Stakeholder	Function interviewee	Date
Public parties	Municipality of Rotterdam	Alliance Manager Next Generation Residential Areas	25-02-2021
	Municipality of Rotterdam	Program Manager Circularity	17-03-2021
	Municipality of Rotterdam	Consultant Circular & Climate adaptive	18-03-2021
	Municipality of Rotterdam	Residents coach (advisor home maintenance and sustainability)	11-03-2021
	Municipality of Amsterdam	Senior Advisor Energy and Circular Development	05-02-2021
Intermediaries	Delft University of Technology	Doctoral Researcher Housing Management	08-03-2021
	Rotterdam University of Applied Sciences/ BouwhulpGroep	Consultant at BouwhulpGroep and lecturer Sustainable Renovation at the knowledge center Sustainable Port City and Rotterdam University of Applied Sciences	11-03-2021
	Dutch Organization for Applied Scientific Research (TNO)	Scientist Integrator Sustainable and Circular Construction Concepts at TNO	15-03-2021
	Platform31	Project Leader Sustainability, Circular Society and Upscaling	08-03-2021
	C-Creators	Circular Construction Specialist	01-04-2021

Interview phase 2

	Stakeholder	Function interviewee	Date
Private parties	Sector organization for demolition contractors and asbestos removal companies (VERAS)	Secretary	09-03-2021
	Sector organization Recycling Breaking and Sorting (BRBS)	Director and member of the circular construction economy transition team	11-03-2021
	Dutch Association of Supplying Building Materials Industry (NVTB)	Director and member of the circular construction economy transition team	12-03-2021
	Sector organisation Technology Netherlands	Team leader Technology Netherlands Advice	04-03-2021
	Architect Maken	Founder and Architect	23-04-2021
	A van Liempd	Circular demolition specialist	26-04-2021
	Copper8	Consultant	29-04-2021
Civil organizations	Van Omme en de Groot	Director Transformation, Renovation & Maintenance	22-04-2021
	Raab Karcher	Deputy Director of Greenworks	20-04-2021
	Stichting !WOON	Consultant and member of the Natural Gas Free project team in Amsterdam	18-03-2021
	Association Eigen Huis (VEH)	Construction Specialist at the Knowledge Center of VEH	21-03-2021
Home-owner	Het Groene Bureau	Entrepreneur and private homeowner who has renovated his house in a circular manner	21-04-2021

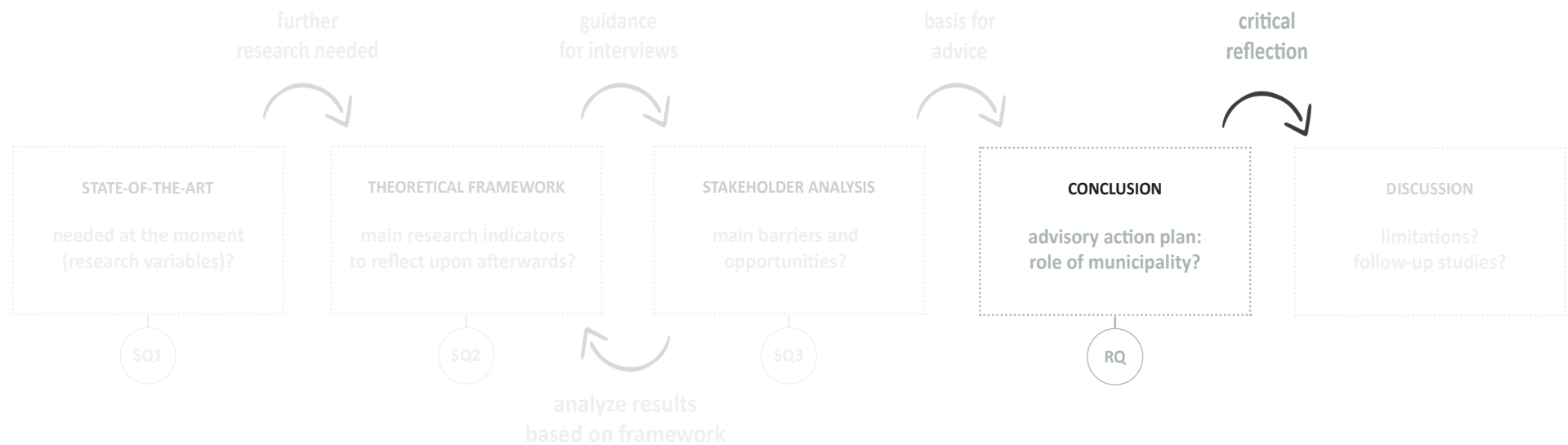
SQ3

How do different actors of CSC networks see and experience the **role of the municipality** within CSCC to achieve upscaling of circular renovation of owner-occupied homes?



RQ

How could **CSCC be facilitated by municipalities** to achieve upscaling of circular renovation of Dutch owner-occupied housing?



RESEARCH APPROACH

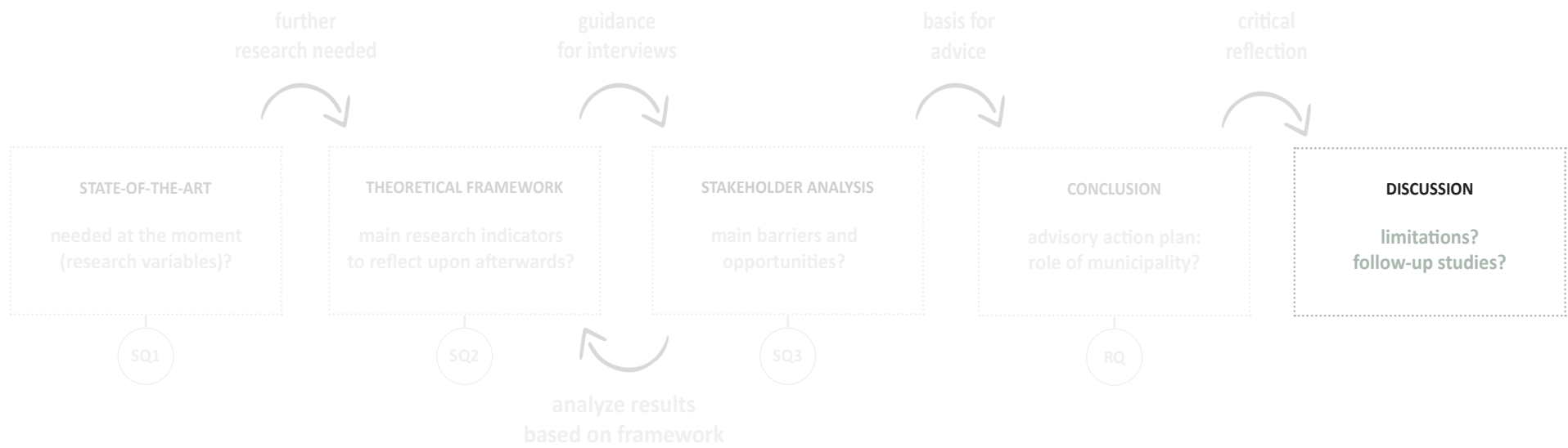
STATE-OF-THE-ART

THEORY & CONCEPTS

STAKEHOLDER ANALYSIS

CONCLUSION

DISCUSSION



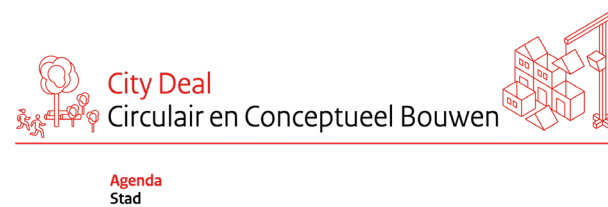
*What is the **state-of-the-art** of circular building and renovation in the Netherlands?*

SQ1









Agenda
Stad

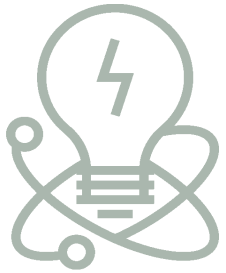


“*a fully circular construction economy by 2050*”

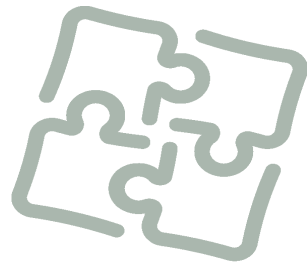




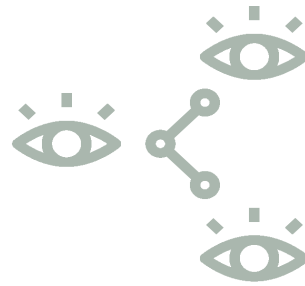




innovation



actor networks



future visions








supply chain learning













circular business-models






*Which relevant **research indicators** related to circular supply chain collaboration could be used in developing a theoretical framework?*

SQ2

<i>Research indicator related to CSCC</i>	<i>Research variable</i>				
					
(1) Communication	X		X	X	X
(2) Exchange of knowledge and information	X	X	X	X	
(3) Coordination	X	X		X	
(4) Integration	X	X			
(5) Trust	X	X	X		
(6) Learning and experimentation	X		X		
(7) Win-win orientation		X	X		X
(8) Alignment	X	X			X
(9) Guidance and direction				X	X
(10) Openness and transparency	X		X		
(11) Motivation				X	X
(12) Inspiration				X	X
(13) Clarity		X	X		
(14) Awareness			X		

<i>Research indicator related to CSCC</i>	<i>Research variable</i>				
					
(1) Communication	X		X	X	X
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(6) Learning and experimentation	X		X		
(7) Win-win orientation		X	X		X
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*How do different actors of CSC networks see and experience **the role of the municipality** within CSCC to achieve the upscaling of circular renovation of owner-occupied homes?*

SQ3







“*The integration of themes is certainly a key to solutions.*”

– TNO, Scientist Integrator Sustainable and Circular Construction Concepts



internal coordinator(s)



internal integrated
working groups

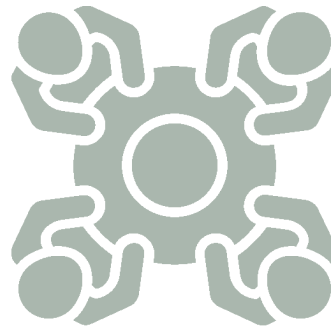


informal teambuilding
workshops

“***The integration of themes is certainly a key to solutions.***”
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internal integrated
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informal teambuilding
workshops

“If there is a clear team feeling, then you make a combination between knowledge development and a ‘we factor’. We are doing something together and we want to achieve something together.”

- Municipality of Rotterdam, Program Manager Circularity



internal coordinator(s)

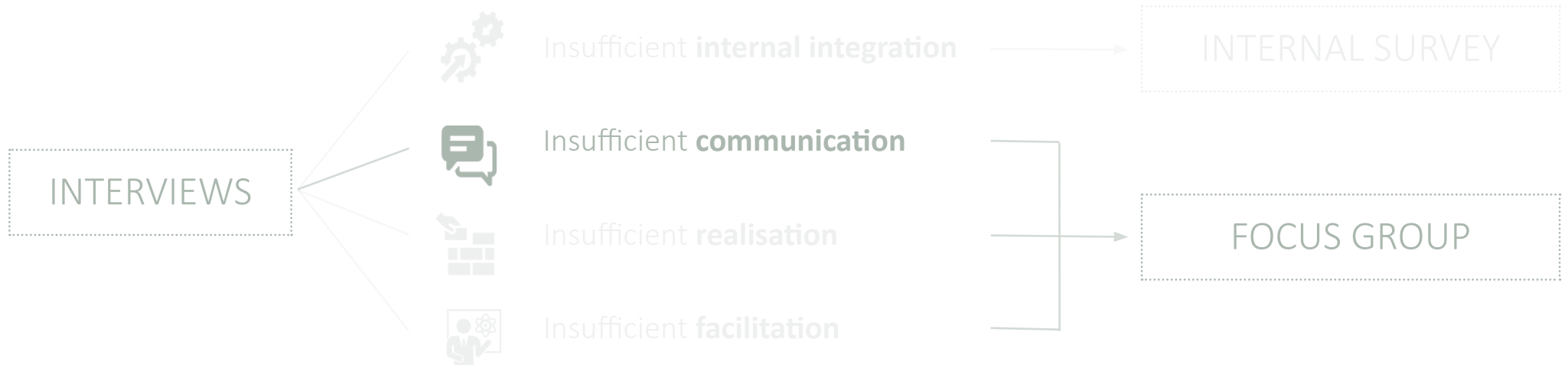


internal integrated
working groups



informal teambuilding
workshops





“

In these kinds of developments, I see the role of the municipality as a director in bringing together supply and demand.

”

- Municipality of Rotterdam, Program Manager Circularity



dialogues with private parties, civil organizations and residents



use social media



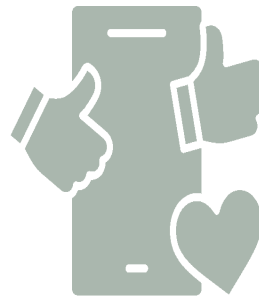
improve municipal website(s)

“You have to place the incentive in such a way that you drive the innovation you want.”

- Municipality of Rotterdam, Alliance Manager Next Generation Residential Areas



dialogues with private parties, civil organizations and residents



use social media



improve municipal website(s)

Keep it simple and close, then it will be fine.

- Municipality of Rotterdam, Resident Coach, advisor home maintenance and sustainability



dialogues with private parties, civil organizations and residents



use social media

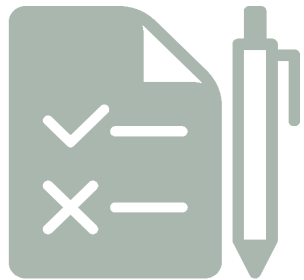


improve municipal website(s)



“Practice what you preach. If we don’t take it seriously ourselves, we can’t blame residents for not taking it seriously.”

- Municipality of Rotterdam, Consultant Circular and Climate Adaptive



**test own policy and use
example projects**



experimental possibilities

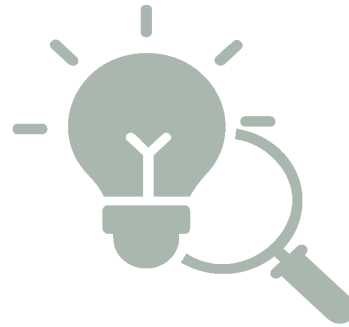


regular evaluation moments

“**Much more flexibility is needed. Give the market room to experiment.**”
– Association Eigen Huis, Construction Specialist



test own policy and use
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experimental possibilities



regular evaluation moments

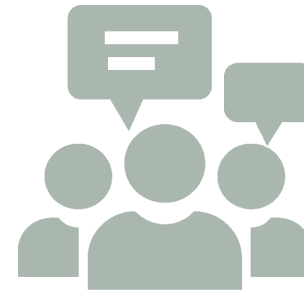
“**Market and government need each other to shape circular innovation.**”
- Platform31, Project Leader Sustainability, Circular Society and Upscaling



test own policy and use
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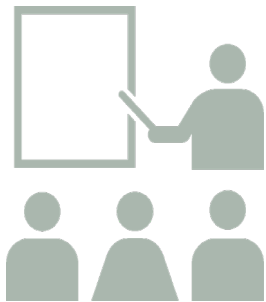


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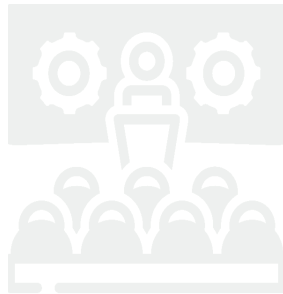


“What I notice is that we, as knowledge institutions, have a very crucial role in the dissemination of knowledge. It is my role to show what is already there and how they can make choices.”

- TU Delft, Doctoral Researcher Housing Management



(online) theme sessions



comprehensive courses



teaching programs



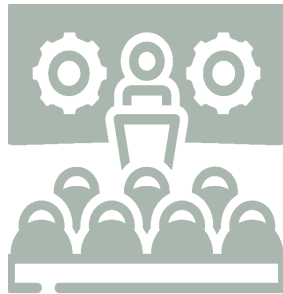
location for material hub

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teaching programs



location for material hub

“Children also play a crucial role in raising awareness of circularity. For them, this transition is important, because it’s about their future. In a few years, if the urgency is even greater, they will have to continue it.”

- Architectuur Maken, Architect and Founder



(online) theme sessions



comprehensive courses



teaching programs



location for material hub

“If you want to encourage collaboration, the municipality should work together with the people who are already doing it and give them the opportunity to work that out.”

– Sustainability Advisor Urban Development



(online) theme sessions



comprehensive courses



teaching programs



location for material hub



How could **CSCC be facilitated by municipalities** to achieve upscaling of circular renovation of Dutch owner-occupied housing?

RQ

INTERNAL INTEGRATION

Task: stimulate internal integration between colleagues, visions, ambitions and social challenges of different clusters and departments. **Consequence:** the following step to external transparent CSCC will be smaller.



COMMUNICATION

Task: create open, transparent and accessible communication network between public and private parties. **Consequence:** more awareness and support will be created, which will have a positive influence on CSCC.



Municipality
as director



FACILITATION

Task: offer various (municipal) tools to help the market in start-up phase. **Consequence:** transition will be accelerated and more awareness and support will be created, which will have a positive influence on CSCC.



REALIZATION

Task: implement developed circular and modular building and renovation ideas, principles and concepts, starting with pilot projects and experiments. **Consequence:** learning by doing.

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LIMITATIONS OF RESEARCH

- Limitation of switching research method
- Limitation of sampling method
- Limitation of (online) focus group discussion
- Underexposing (circular) business models
- Reflection on SDGs
- Results not entirely generalizable
- Time restriction

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FOLLOW - UP STUDIES

- In-depth research
- Research into public-private partnerships
- Research into laws and regulations
- Research into building materials
- Research into (circular) network of Rotterdam

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Global



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National



Provincial



Municipal

Circular supply chain management

The role of the municipality within circular supply chain collaboration to achieve upscaling of circular renovation of Dutch owner-occupied housing

Suzanne Nathalie Oskam
Technical University of Delft
MSc Architecture and the Built Environment

ADVIESRAPPORT

gebaseerd op wetenschappelijk onderzoek naar de rol van de gemeente bij het initiëren van circulaire ketensamenwerking om tot opschaling te komen van circulaire renovatie van de particuliere woningvoorraad

making the world a better place



transformation
towards a circular economy



renovation
of the existing building stock



collaboration
within circular supply chains

Thank you for your attention

Additional slides

15 JUNE 2021

OPENING CIRCULAIR LOKET



OPENING CIRCULAIR LOKET

Maandag 21 juni (16.30 – 18.00) is het zover! Live vanuit BlueCity opent de gemeente Rotterdam, in samenwerking met [DCMR Milieudienst Rijnmond](#), een Circulair Loket waar ondernemers terecht kunnen met alle vragen die komen kijken bij het gebruiken van afval als grondstof. Benieuwd hoe je met jouw onderneming een succesvolle circulaire start maakt? Meld je dan aan!

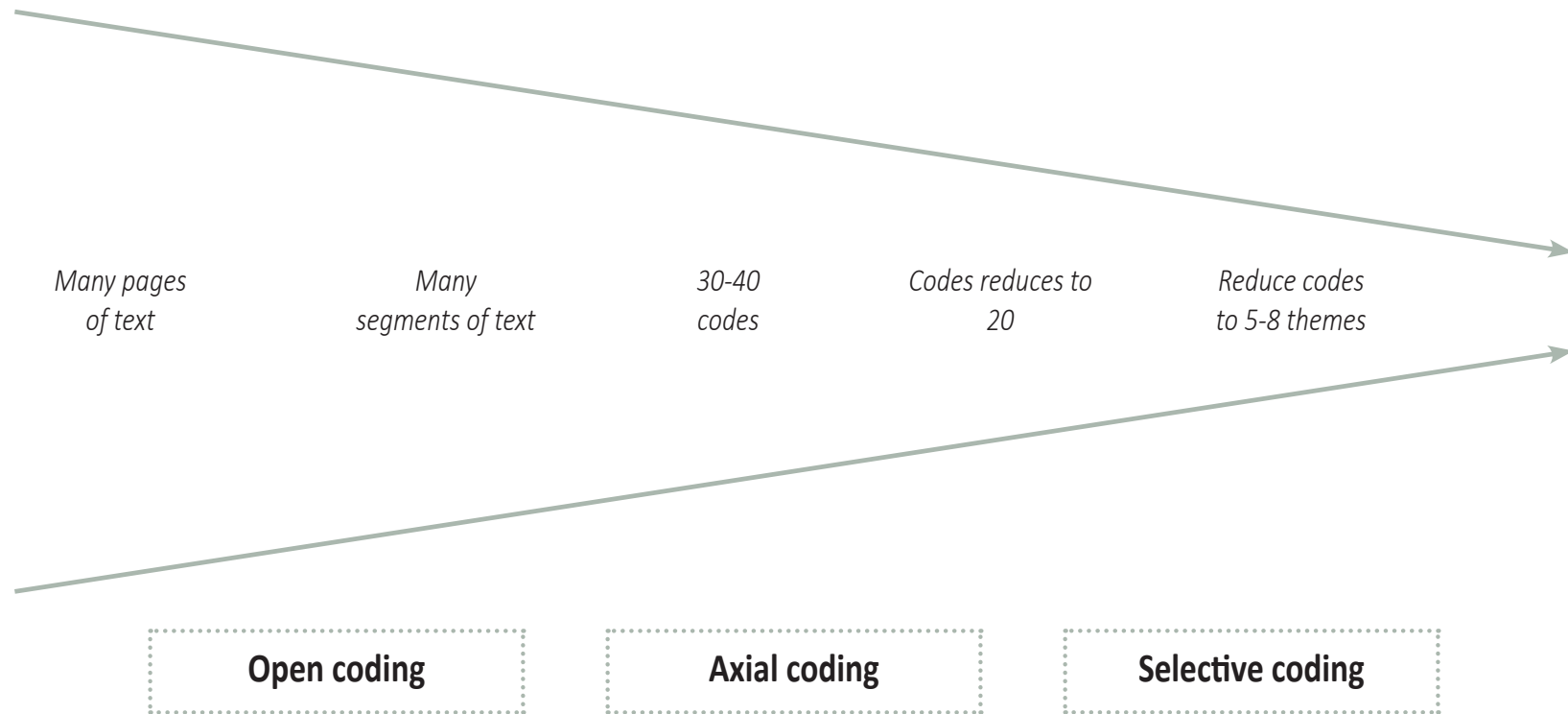
Some partners of Rotterdam



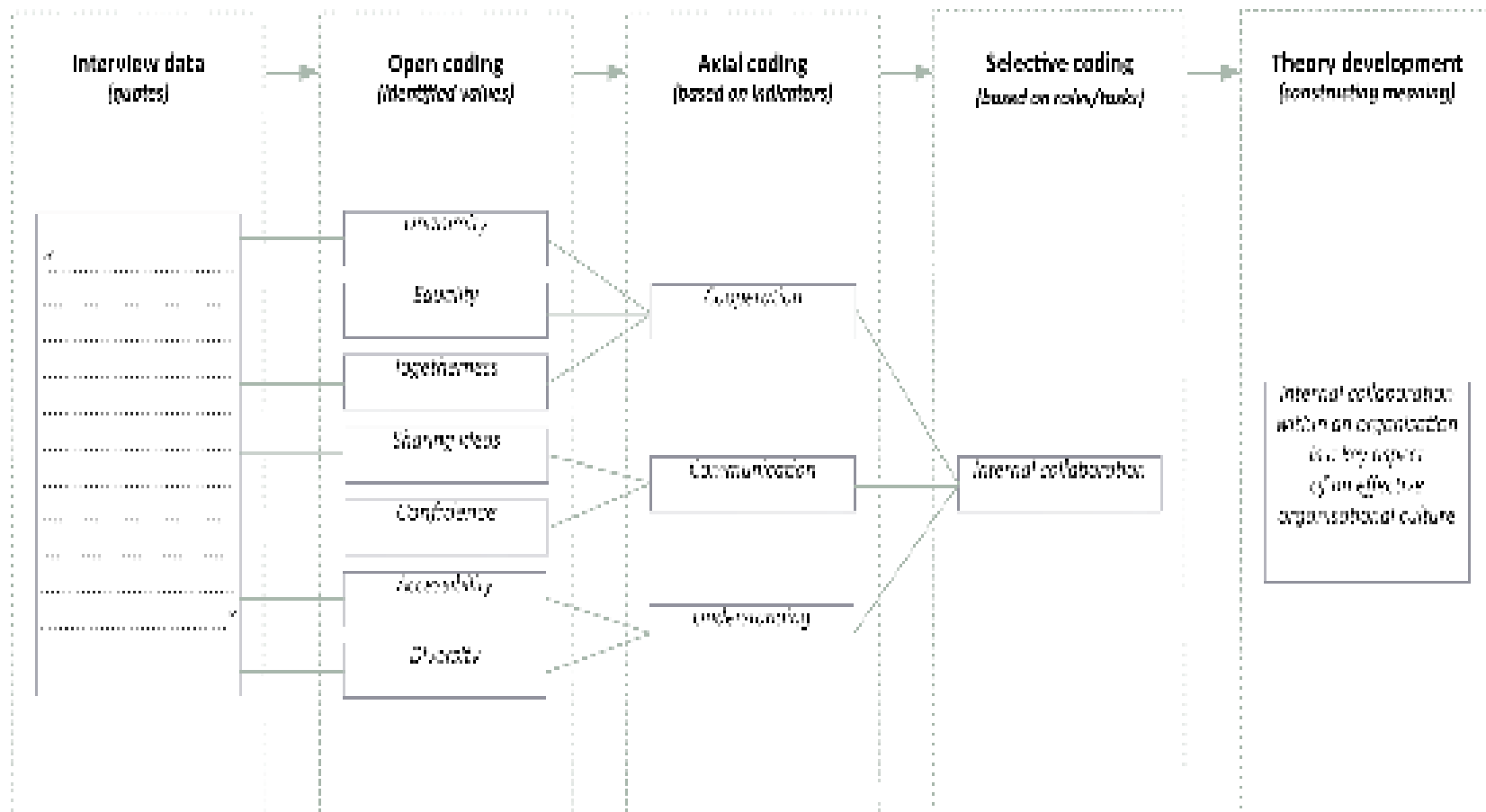
Circular renovation

Refurbishing or improving the technical and/or functional quality of an existing (construction) product with the intention of contributing to a circular economy, by using product parts from a discarded product with a similar function, without unnecessarily depleting natural resources, polluting the living environment and affecting ecosystems (own definition, based on CB'23, 2019b).

Analyse method (based on Williams and Moser, 2019, p. 47)



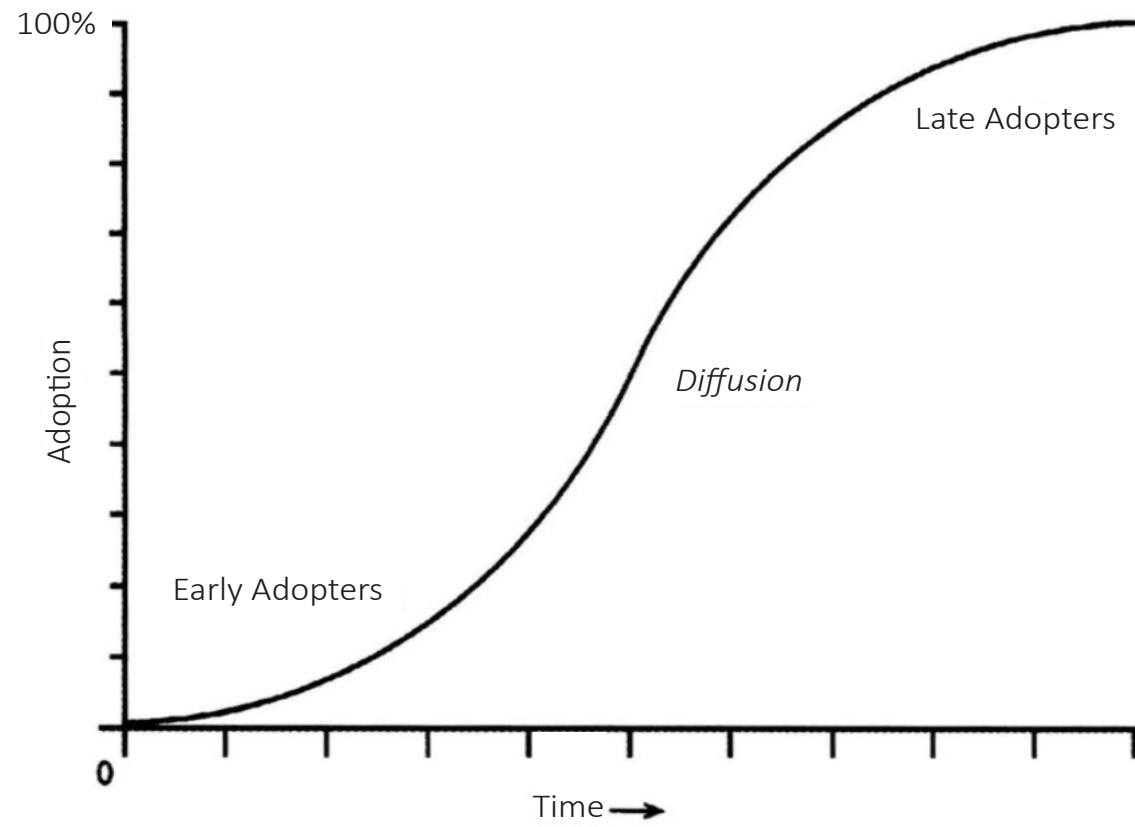
Analyse method (based on Williams and Moser, 2019, p. 47)



Adoption process of a new product in Rogers' adoption model (Rogers, 1962).



The smaller chasm; the 'take off' of the diffusion of an innovation (Larson & Meyer, 2006, p. 81).



Theoretical framework

Research indicator related to CSCC	Research variable					Reference(s)
	Innovation	Actor networks	Supply chain learning	Future visions	(Circular) business models	
(1) Communication	X		X	X	X	13x Rogers, 1962; Dierkes et al., 1996; Morrison et al., 2000; Morrison et al., 2000; Spekman et al., 2002; Koebel et al., 2004; Osterwalder et al., 2005; Larson and Meyer, 2006; Mahapatra et al., 2013; Hume and Leonard, 2013; Borcaa and Baesu, 2014; Jacobs et al., 2016; Meijer et al., 2018
(2) Exchange of knowledge and information	X	X	X	X		11x Dierkes et al., 1996; Gordon & McCann, 2000; Spekman et al., 2002; Mowery and Nelson, 2006; Zhao et al., 2011; Zhao et al., 2011; Mariotto, 2012; Lambrechts et al., 2012; Mlecnik, 2013b; Jacobs et al., 2016; Brown et al. 2019
(3) Coordination	X	X		X		9x Dierkes et al., 1996; Lee and Ng, 1998; Kilger and Stadtler, 2008; Van der Helm, 2009; Zhao et al., 2011; Davidson, 2013; Williams et al., 2017; Lüdeke-Freund et al., 2018; Brown et al., 2019
(4) Integration	X	X				7x Akintoye et al., 2000; Christopher, 2005; Kilger and Stadtler, 2008; Zhao et al., 2010; Zhu et al., 2010; Bygballe and Ingemansson, 2014; Adams et al., 2017
(5) Trust	X	X	X			5x Rogers, 1962; Spekman et al., 2002; Borgatti and Ofem, 2010; Bygballe and Ingemansson, 2014; Jacobs et al., 2016
(6) Learning and experimentation	X		X			7x Bessant and Tsekouras, 2001; Spekman et al., 2002; Mowery and Nelson, 2006; Lambrechts et al. 2012; Mlecnik, 2013b; Gosling et al., 2017; Brown et al., 2019
(7) Win-win orientation		X	X		X	4x Spekman et al., 2002; Kilger & Stadtler, 2008; Stubbs and Cocklin, 2008; Bocken et al., 2014
(8) Alignment	X	X			X	3x Zhao et al., 2010; Vernay, 2013; Stubbs and Cocklin, 2008
(9) Guidance and direction				X	X	3x Van der Helm, 2009; Boons et al., 2013; Ellen MacArthur Foundation, 2013
(10) Openness and transparency	X		X			3x Barratt, 2004; Jacobs et al., 2016; Jacobs et al., 2016
(11) Motivation				X	X	2x Van der Helm, 2009; Boons et al., 2013
(12) Inspiration				X	X	2x Van der Helm, 2009; Boons et al., 2013
(13) Clarity		X	X			1x Gimenez and Tachizawa, 2012; Lambrechts et al., 2012
(14) Awareness			X			1x Lambrechts et al., 2012

How indicators will be tested during interviews

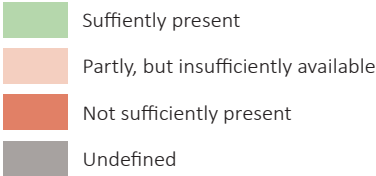
Research indicator related to CSCC	How to investigate in the interviewphases?
(1) communication	Ask the stakeholder about experiences with regard to (sufficient) communication within and between organization(s), including local governments.
(2) exchange of knowledge- and information	Investigate whether the stakeholder agrees that sufficient knowledge and information is exchanged within and between organization(s), including the role of local governments therein.
(3) coordination	Ask the stakeholder whether coordination is required/desired for (stimulating/facilitating) CSCC, including the role of local governments therein.
(4) integration	Investigate whether the stakeholder agrees that there is sufficient integration within and between organisation(s)/visions/ambitions, including the role of local governments therein.
(5) trust	Ask the stakeholder about experiences with regard to trust and mutuality within and between organization(s), including local governments.
(6) learning and experimentation	Investigate whether the stakeholder agrees that there are sufficient learning and experimentation opportunities, including the role of local governments therein.
(7) win-win orientation	Investigate whether the stakeholder agrees that there is a win-win orientation within and between organisation(s), including the role of local governments therein.
(8) alignment	Investigate whether the stakeholder agrees that there are sufficient alignment within and between organisation(s)/visions/ambitions, including the role of local governments therein.
(9) guidance and direction	Investigate whether the stakeholder agrees that there is sufficient guidance within and between organisation(s), including the role of local governments therein.
(10) openness and transparency	Ask the stakeholder about experiences with regard to openness and transparency within and between organization(s), including local governments.
(11) motivation	Investigate what motivates the stakeholder to undertake circular (renovation) actions and what motivates them for CSCC.
(12) inspiration	Investigate what inspires the stakeholder to undertake circular (renovation) actions and what inspires them for CSCC.
(13) clarity	Investigate whether the stakeholder agrees that there are sufficient clarity within and between organisation(s)/visions/ambitions, including the role of local governments therein.
(14) awareness	Ask the stakeholder about experiences with regard to awareness of CSC actors (including private homeowners) and the role of local governments therein.

Categorisation of indicators into four main barriers

<i>Insufficient internal integration</i>	<i>Insufficient communication</i>	<i>Insufficient realisation</i>	<i>Insufficient facilitation</i>
Alignment	Alignment	Communication	Awareness
Awareness	Awareness	Knowledge/information exchange	Knowledge/information exchange
Integration	Communication	Learning and experimentation	Openess and transparency
Knowledge/information exchange	Coordination	Win-win situation	
Openess and transparency	Clarity	Motivation	
Learning and experimentation	Knowledge/information exchange	Inspiration	
	Openess and transparency		
	Learning and experimentation		
	Trust		
	Win-win situation		
	Motivation		
	Inspiration		
	Guidance and direction		

Overview interview results

Research indicator related to CSSC	Presence of indicator related to (initiation of) CSSC from different stakeholders' perspectives																							
	Public parties				Intermediaries				Private parties				Civil organizations	Home owner										
	Rotterdam - Alliance Manager Next Generation Residential Areas	Rotterdam - Program Manager Circularity	Rotterdam - Consultant Circular and Climate adaptive	Rotterdam - Residents advisor home maintenance and sustainability	Amsterdam - Senior Advisor Energy and Circular Development	TU Delft - Doctoral Researcher Housing Management	Bouwrijpogroep - Consultant and lecturer Sustainable Renovation	TNO - Scientist Integrator Sustainable and Circular Construction Concepts	Platform31 - Project Leader Sustainability, Circular Society and Upscaling	C-Creators - Circular Construction Specialist	VERAS - Secretary	BRBS - Director and member of the CCE transition team	NVTB - Director and member of the CCE transition team	Technology NL - Team leader Technology Netherlands Advice	Architect MAREN - Founder and Architect	A van Liempd - Circular demolition specialist	Copper8 - Consultant	Van Omme en de Groot - Director Transformation, Renovation & Maintenance	Raab Karcher - Greenworks - Deputy Director of Greenworks	Stichting WOONI - Consultant and member of the Natural Gas Free project team	VEH - Construction Specialist at the Knowledge Center of VEH	Het Groene Bureau - Entrepreneur and private homeowner who has renovated his house in a circular manner		
(1) knowledge- and information exchange																								
(2) learning and experimentation																								
(3) coordination																								
(4) communication																								
(5) openness and transparancy																								
(6) trust and mutuality																								
(7) win-win orientation																								
(8) alignment																								
(9) integration																								
(10) clarity																								
(11) awareness																								
(12) motivation																								
(13) inspiration																								
(14) guidance and direction																								



Overview interview results related to four main barriers

Opportunities: desired/needed roles and actions of the municipality related to (initiation of) CSCC from different stakeholders' perspectives					
		Insufficient internal integration	Insufficient communication	Insufficient realization	Insufficient facilitation
Public parties	Rotterdam - Alliance Manager Next Generation Residential Areas	Integrate the different transitions Organize internal theme sessions	Show examples Unburden residents (components)	Challenging the market Stimulate the market Launching customer	Organize theme sessions Facilitate innovation platform Make visions concrete
	Rotterdam - Program Manager Circularity	Give concrete cause Combine learning and 'we' factor	Create a campaign	Show confidence in market Enter into a dialogue with market Start small but real	Make location available for 'hub' Act as a director
	Rotterdam - Consultant Circular and Climate adaptive	Integrate the different transitions	Challenge the residents Stimulate the residents Show good examples	Encourage at demand Do not work too project-based Start small but real	Facilitate space to gain experience
	Rotterdam - Residents advisor home maintenance and sustainability	Cooperate with other departments Organize internal theme sessions Financial contribution of departments	Use social media Provide a physical service point Unburden residents (components)	Do not work too project-based Do good preliminary research	Organize purchasing actions Create knowledge sharing platform
	Amsterdam - Senior Advisor Energy and Circular Development	Circular Office: knowledge sessions, training and education	Unburden residents	Enter into a dialogue with market Set up frames Link to social factor Circular tendering	Help the market in the start-up phase (pilots, own real estate etc.)
Intermediaries	TU Delft - Doctoral Researcher Housing Management	Integrate the different transitions	Unburden residents (components) Emphasize urgency Use model homes	Be clear in your prioritization Include market initiatives in policy Start small but real	Help the market in the start-up phase (pilots, own real estate etc.) Make visions concrete
	Bouwhulpgroep - Consultant and lecturer Sustainable Renovation	Create integral project and organization quality	Designate experiment area Unburden residents (components) Provide a physical service point	Tap into market initiatives Designate experiment area Start small but real Circular tendering	Help the market in the start-up phase (pilots, own real estate etc.) Make visions concrete
	TNO - Scientist Integrator Sustainable and Circular Construction Concepts	Integrate the different transitions Financial contribution of departments	Inspire, stimulate, explain, unburden the residents (components)	Show confidence in market Take a pioneering role with own real estate Circular tendering	Make visions concrete
	Platform31 - Project Leader Sustainability, Circular Society and Upscaling	Integrate the different transitions Financial contribution of departments	Draw up achievable visions	Designate experiment area (more flexible licensing)	Facilitate space to gain experience
	C-Creators - Circular Construction Specialist	X	Draw up achievable visions Inspire, stimulate residents Explain added values	Challenging the market Stimulate the market Circular tendering	Help the market in the start-up phase (pilots, own real estate etc.) Facilitate space to gain experience Facilitate training/education
Private parties	VERAS - Secretary	X	Provide information to the public Repetition in communication	Circular tendering Designate experiment area (more flexible licensing)	Facilitate space to gain experience Act as a director
	BRBS - Director and member of the CCE transition team	Integrate the different transitions, visions, ambitions	Enhance people through R-center Physical meeting places	Start small but real Launching customer	Help the market in the start-up phase (pilots and, real estate etc.) Materials bank

Private parties	NVTB - Director and member of the CCE transition team	Integrate the different transitions, visions, ambitions	Draw up achievable visions Inspire, stimulate residents Explain added values	Challenging the market Stimulate the market	Surveillance and enforcement Make visions concrete
	Technology NL - Team leader Technology Netherlands Advice	Interne director	Draw up achievable visions Inspire, stimulate residents	Circular tendering Launching customer Start small but real Enter into a dialogue with market	Provide guidance, inspire, give examples to the market Make visions concrete
	Architect MAKEN - Founder and Architect	X	Communicate through children Show urgency of transition Sharing experiences (platform) Inspire, stimulate residents	Start small but real Enthuse and make it mandatory Enter into a dialogue with market Create open atmosphere	Facilitate space to gain experience Make a location available for material 'hub' Create knowledge sharing platform
	A van Liempd - Circular demolition specialist	Create integral project and organization quality	Show examples	Connecting with national initiatives Circular tendering	Make location available for 'hub' Connect with existing initiatives Do not do things that are not part of your core business
	Copper8 - Consultant	Integrate the different transitions, visions, ambitions	Communicate through education/ children Inform, inspire residents Show examples	Launching customer (create mass) Challenging the market Designate experiment area (more flexible licensing)	Offer help, support financially Facilitate space to gain experience
	Van Omme en de Groot - Director Renovation & Maintenance	X	Draw up achievable visions Show examples	Enter into a dialogue with market Give concrete cause to learn More flexible licensing	Surveillance and enforcement Support financially Organize theme sessions Make visions concrete
	Raab Karcher - Greenworks - Deputy Director of Greenworks	Integrate the different transitions, visions, ambitions Independent coach	Show examples Knowledge transfer Communication platform	Enter into a dialogue with market Create support for plans	Facilitate market dialogue Organize (online) knowledge event and make project available
Civil organizations	Stichting WOON! - Consultant and member of the Natural Gas Free project	Integrate the different transitions, visions, ambitions Independent coordination	Use model homes (on a wider scale) Communicate through education Reward good behavior	Circular tendering Set up frames Link to social factor	Surveillance and enforcement Bringing supply/demand together Facilitate training/education Make location available for 'hub'
	VEH - Construction Specialist at the Knowledge Center of VEH	Integrate the different transitions, visions, ambitions	Unburden residents (prefab) Citizen participation	Stimulating modular construction Designate experiment area (more flexible licensing) Enthuse and make it mandatory	Facilitate space to gain experience
Home owner	Het Groene Bureau - private homeowner who has renovated his house (circular)	X	Citizen participation Use residents to promote in city Communicate through children	Start small but real Designate experiment area (more flexible licensing)	Bringing supply/demand together Make location available for 'hub' / R-centrum, (de)centralized

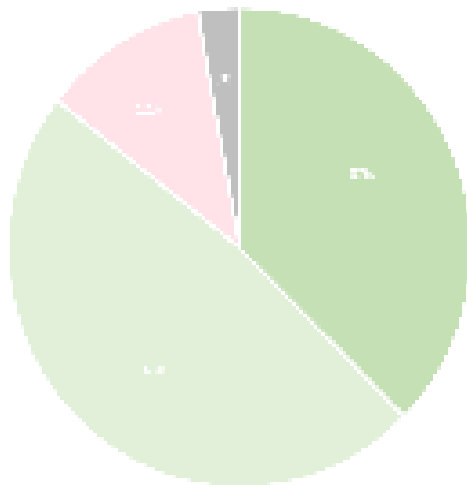
Main results internal survey

Barrier	Discussed themes	Suggested opportunities followed from interviews	(Additional) suggested opportunities followed from internal survey
Insufficient internal integration	Internal cooperation	<ul style="list-style-type: none"> Open transparent atmosphere Shared goals, visions, ambitions Integration of various themes Joint budgeting and accountability Director who integrates several tasks 	<ul style="list-style-type: none"> Internal coordination and control Certainty about responsibilities Integral working groups Clarity about (linkage) opportunities
	Unfamiliarity among colleagues	<ul style="list-style-type: none"> Sharing information and knowledge Concrete reason to learn together Theme-sessions, lectures, workshops Informal sessions 	<ul style="list-style-type: none"> Accessible/informal communication Integral working groups

Internal survey

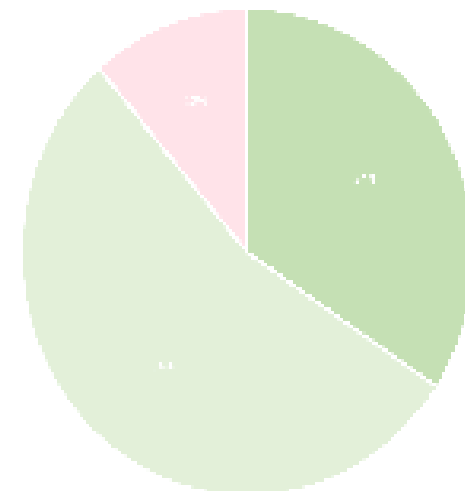
[More] cooperation between different departments is needed to scale up sustainable (and circular) renovation of the private housing stock in Rotterdam.

Strongly agree Agree Neither Disagree Strongly disagree



I am willing to collaborate (more) with other departments/cluster to scale up sustainable and/or circular renovation of the private housing stock in Rotterdam

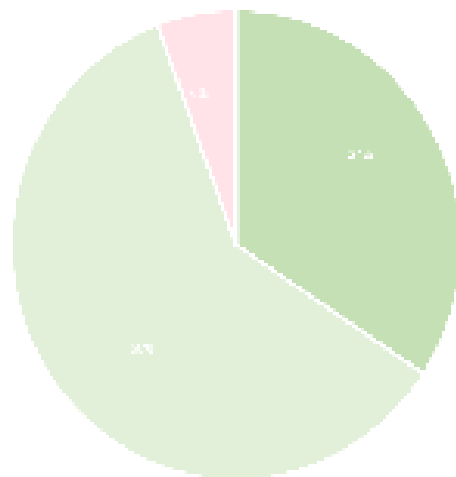
Strongly agree Agree Neither Disagree Strongly disagree



Internal survey

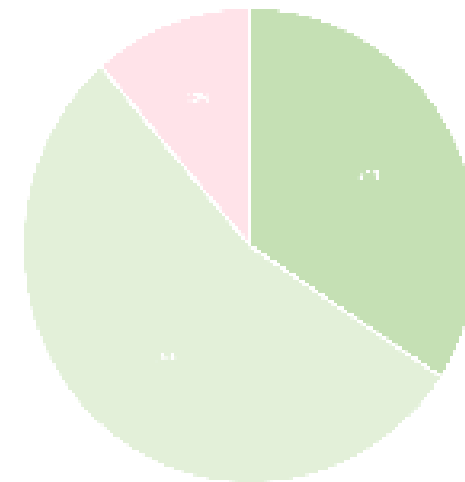
(More) sharing of knowledge, experiences and ambitions between different clusters/departments is necessary for upscaling of sustainable (and circular) renovation of the private housing stock in Rotterdam.

Strongly agree Agree Neutral Disagree Strongly disagree



I am willing to collaborate (more) with other departments/clusters to scale up sustainable and/or circular renovation of the private housing stock in Rotterdam.

Strongly agree Agree Neutral Disagree Strongly disagree



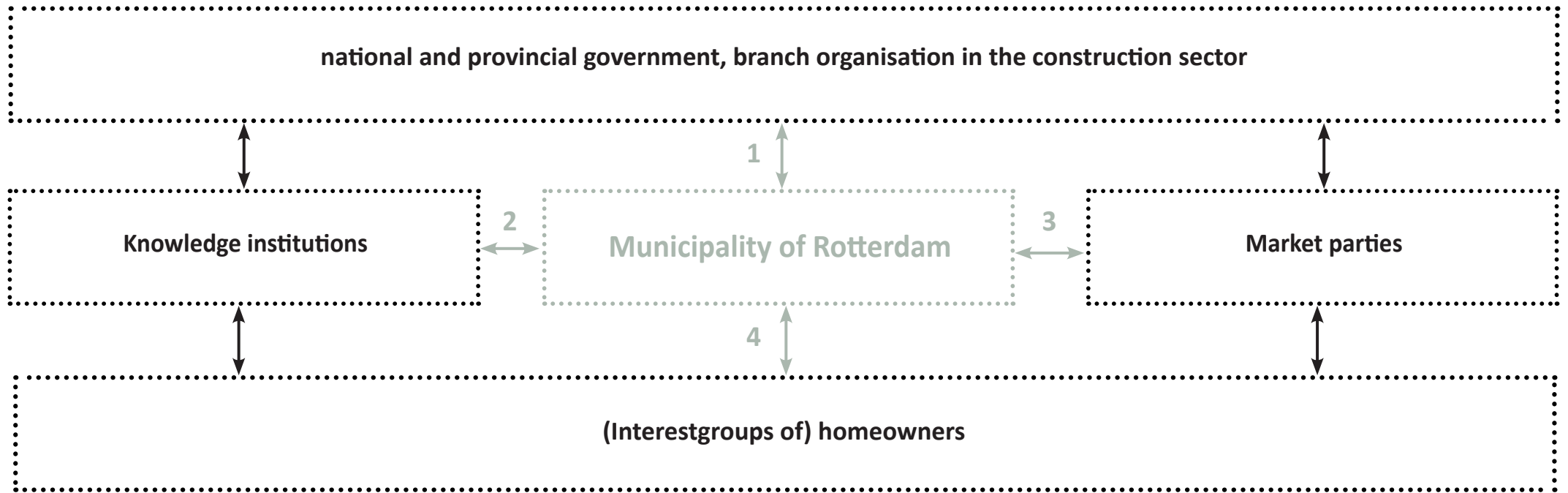
Themes that are discussed in focus group

Barrier	Discussed question	Suggested opportunities
Insufficient communication	Hoe could the municipality reach, inform and enthuse its residents about circular renovation options?	Set good examples with own real estate and public space and use as communication tool
		Facilitate circular (renovation) platform for both supply and demand and use as communication tool
Insufficient realisation	How could cooperation between policymakers and non-policymakers be organised in order to realise future visions?	Draw up visions together (policy and non-policymakers)
		Designate experimental areas in the city
Insufficient facilitation	How could (local) chain cooperation be facilitated and stimulated?	Organise workshops and knowledge sessions for market, residents and municipality to stimulate cooperation
		Make location available for local construction hub and link to existing initiative(s)

Main results focus group discussion

Barrier	Discussed questions	Suggested opportunities followed from interviews	(Additional) suggested opportunities followed from focus group discussion
Insufficient realization	How could cooperation between policymakers and non-policy makers be organized in order to realize future visions?	Draw up visions together (policy and non-policy makers)	Test formulated policy for own implementation Conduct evaluation meetings during and after 'test' projects Listen to homeowners input and experiences
		Designate experimental areas in city	Designate also experimental buildings (owned by the municipality)
Insufficient facilitation	How could (local) chain cooperation be facilitated and stimulated?	Organize workshops and knowledge sessions for market, residents and municipality	Facilitate comprehensive courses Integrate vouchers for retraining Make sure smaller companies are seen and can profile themselves Cooperate with construction markets
		Make location available for local construction hub and link to existing initiative(s)	<i>Participants agreed, no additions</i>
Insufficient communication	How could the municipality reach, inform and enthuse its residents about circular renovation options?	Set good examples with own real estate and public space	Make clear what people get in return Make sure people could see and understand the (added) value, through example projects Tackle the immediate environment and public outdoor spaces around the homes Communicate very clearly what the incentives are for certain choices
		Facilitate circular (renovation) platform for both supply and demand	Improve www.duurzaam010.nl and www.rotterdamcirculair.nl : more accessible and better structured Refer to existing initiatives, information and examples Make site/platform accesible to different target groups

Relationships between municipality and stakeholders involved



Validity of the research

- Representative
- Objective
- Critical
- Archivable
- Reliable