

Nordic Networks for Circular Construction

Kiertotalouden ajankohtaispäivät 16.11.2023
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HAYS



Boverket

National Fora

Analysis of
Barriers and
Possibilities

Collaboration
Platform

Communication
and
Coordination



Ympäristöministeriö
Miljöministeriet
Ministry of the Environment



Metrics for
Circularity

Nordic
Construction
Culture



Ministry of Economic Affairs
and Employment of Finland



MINISTRY OF
EDUCATION AND CULTURE
FINLAND

GREEN
BUILDING
COUNCIL
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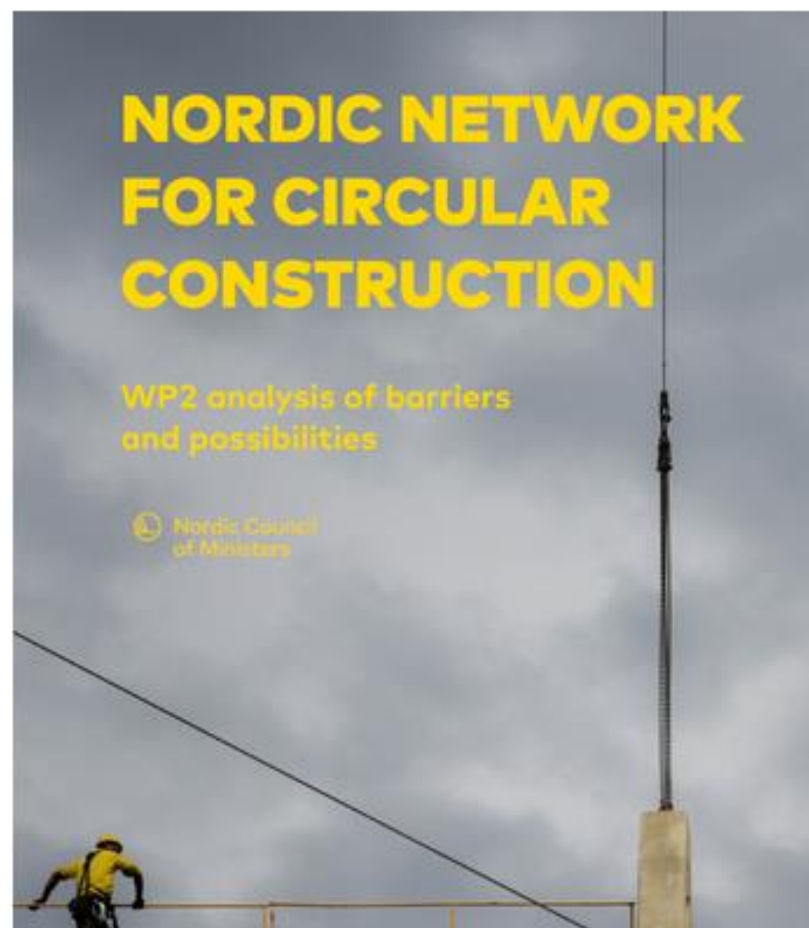




Analysis of Barriers and Possibilities

A circular construction sector is one in which every part of the process of deciding, designing, and constructing new buildings is rethought to include exploiting the value of the materials already present in the built environment and ensure that the buildings designed and built today can maintain their value in the future, either as buildings, or in their constituent components. A report including an analysis of barriers and possibilities was published as a part of work package 2. **The full report is available on the Nordic Council of Ministers' publishing platform.**

This report explores the current state of and framework conditions for the development of a circular construction sector in the Nordic countries, and through consultation with the construction value chain, it identifies barriers that limit the transition to and opportunities that could be exploited to support a more circular approach in the circular construction industry. A main takeaway from the analysis of these barriers is that they are heavily interlinked. For example, lack of



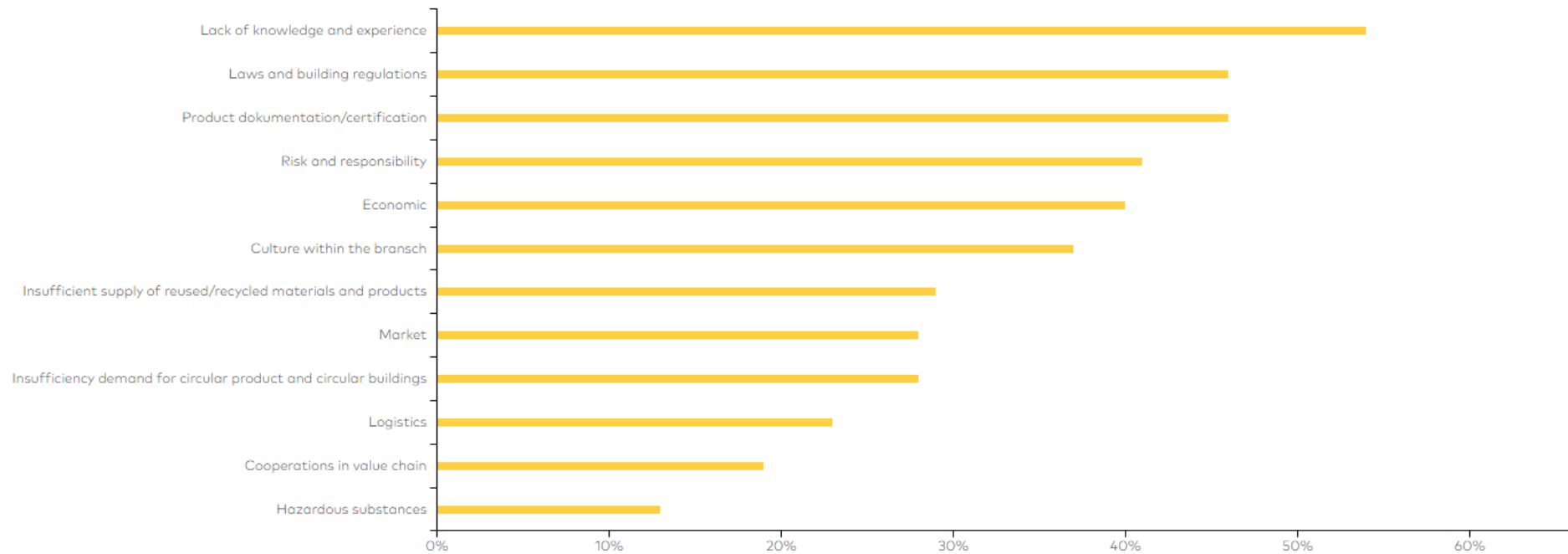


Figure 7 – Survey results - Barriers to circular construction

1

BARRIER 1: LACK OF KNOWLEDGE & EXPERIENCE

Actors along the value chain do not have sufficient knowledge or experience of the methods, processes or routines required for Circular Construction.

OPPORTUNITIES

- **Pilot projects**
Enable new actors to enter the circular construction market under favourable conditions, build experience, and develop and test new methods for all phases of circular construction.
- **Networks**
Provide a meeting place for interested actors to expand their network and learn new competencies.
- **Knowledge centres**
Provide central hubs that collect, collate, and communicate knowledge, experience, and best practices on circular construction.
- **Educational materials**
Provide standardised learning within the sector, both through tertiary education and training, as well as apprenticeship training and education.

Developers & Owners

Developers and owners can help overcome the lack of knowledge and experience as well as any economic and cultural challenges by taking the lead and commissioning CC projects, and by including induced benefits in calculations. They can help overcome risk and responsibility challenges by engaging with the value chain to develop new negotiated responsibilities. To do so, they should plan for a long-term future, embed CC at the start of the process, and support the CC process by synchronising construction and demolition activities.

Architects, engineers and consultants

Architects, designers, and engineers can support developers in the move toward CC by proposing and developing CC solutions, supporting the negotiation of risks and responsibilities, and developing new norms for sourcing more sustainable and/or reused materials. They can also work on integrating CC into existing tools and methods and supporting the integration of CC into existing certification frameworks, all with the clear goal of narrowing, slowing, and closing cycles.

Construction Companies

Construction companies can support the transition to CC and reduce the knowledge and experience gap by engaging with their peers and learning from pilot projects, not least by collaborating with

What is clear from the mapping of the barriers is that they are heavily interlinked and often reinforcing. For example:

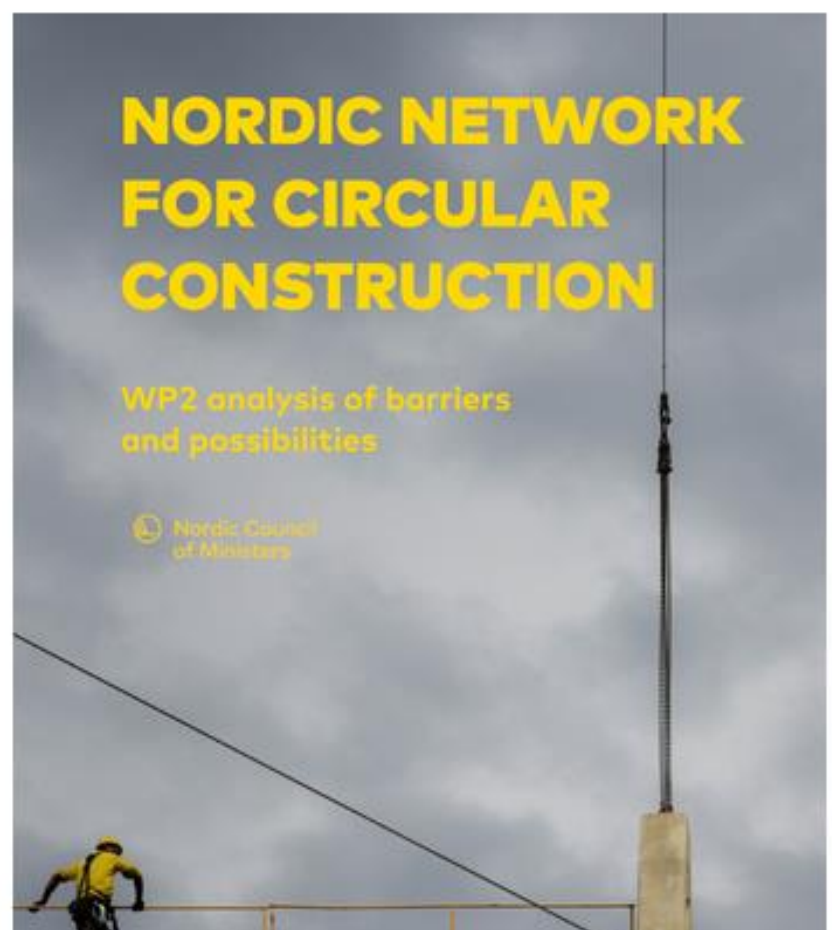
- Lack of experience and knowledge within the sector stems from a lack of opportunity to gain that experience and knowledge, while that same lack of experience and knowledge means that it is difficult to commission projects with a circular focus. Lack of experience and knowledge also leads to longer project time frames and therefore higher expenses.
- Lack of documentation leads to uncertainty about the quality and safety of products and buildings, so the allocation of responsibility becomes a key challenge, which is itself hampered by a lack of experience within the value chain for addressing responsibility in new ways.
- The supply of products for reuse is hampered by the lack of knowledge and experience in terms of disassembly for reuse along with the additional costs associated with these practices and the lack of demand for reused products. The lack of demand for reused products stems at least in part from the uncertainty regarding supply and again about the potential for additional and potentially unknown/hidden costs.



Analysis of Barriers and Possibilities

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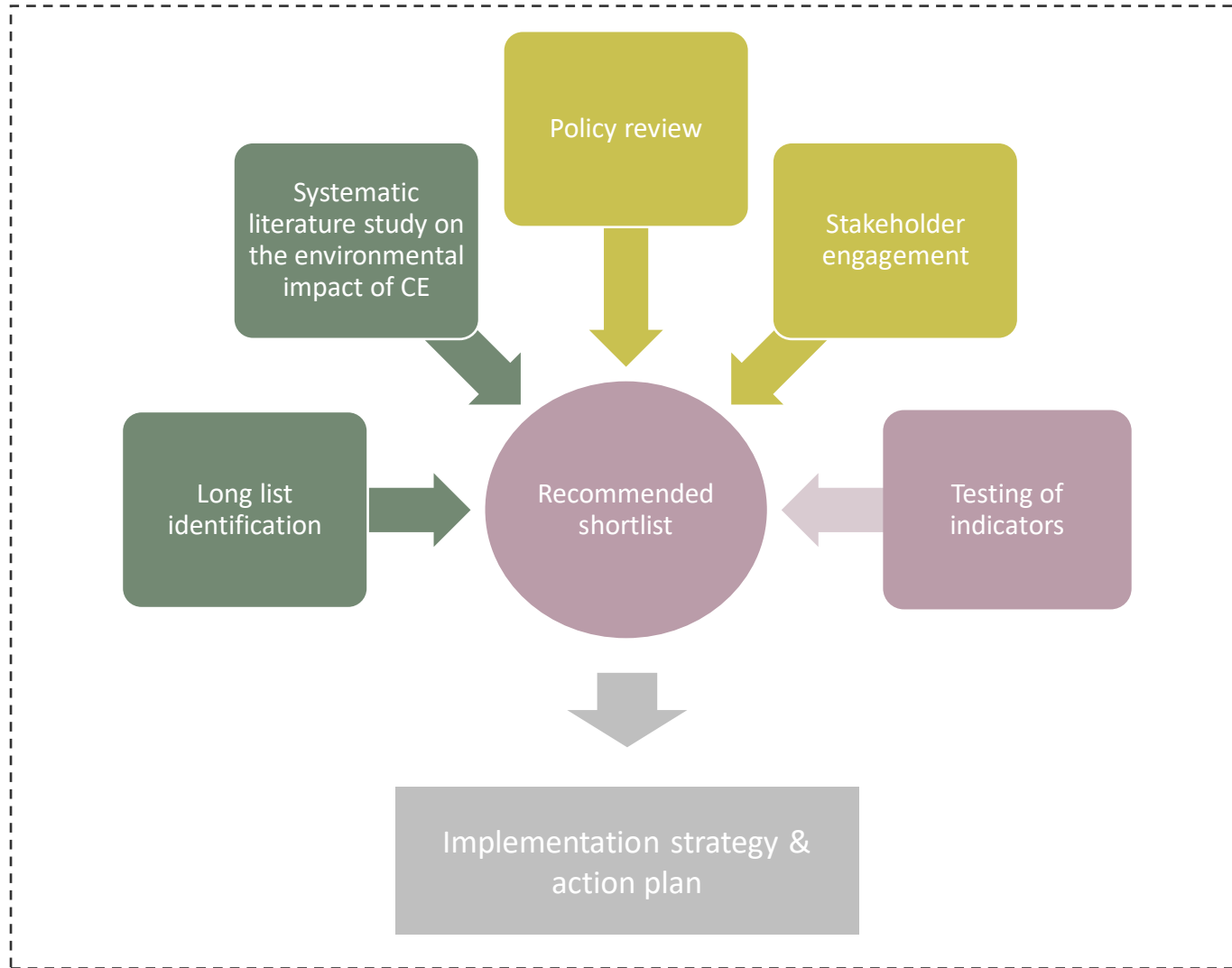


**Näyttää suunnan,
auttaa matkalla.**

Nordic Networks for circular construction: METRICS FOR CIRCULARITY

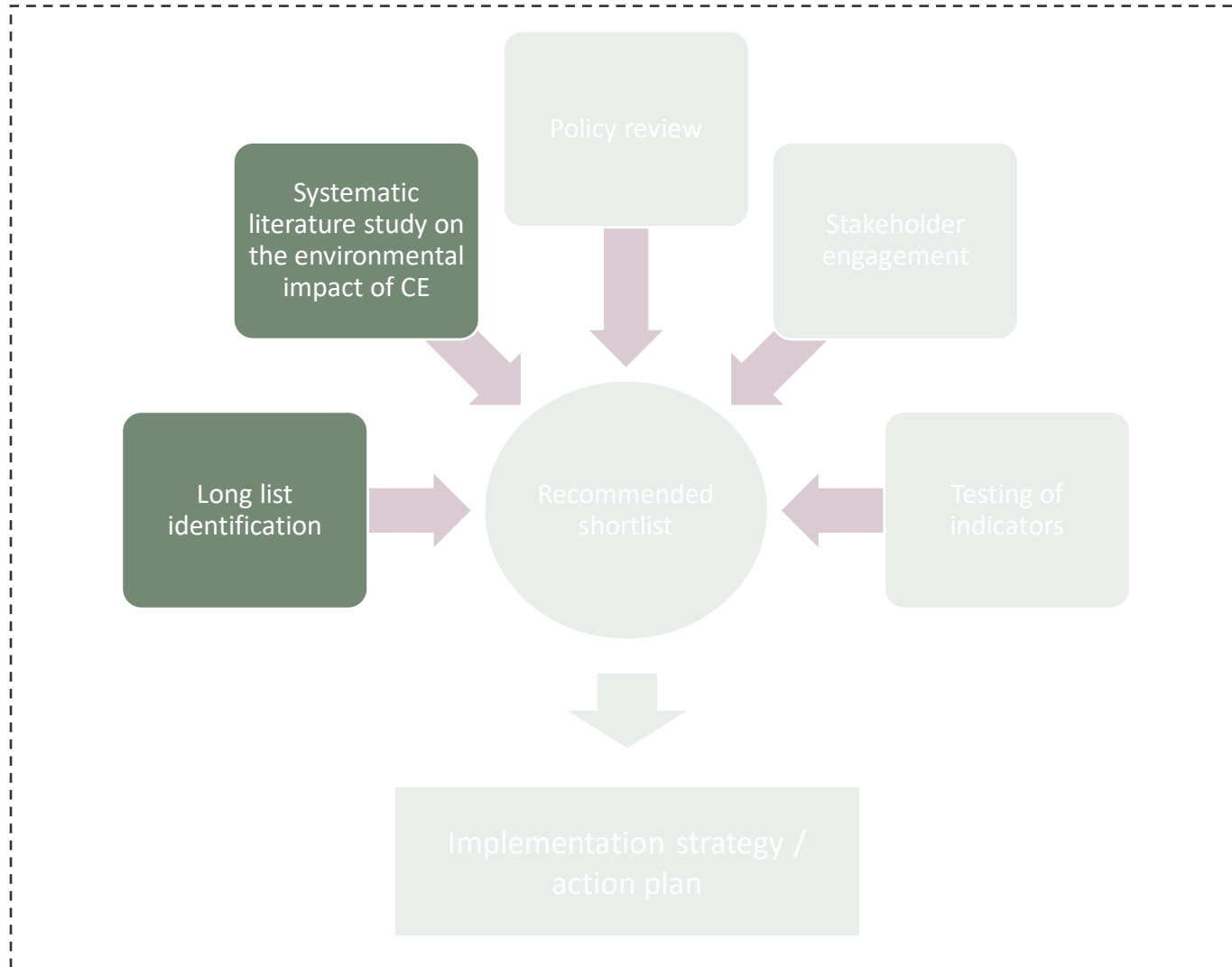


HANKKEEN RAKENNE



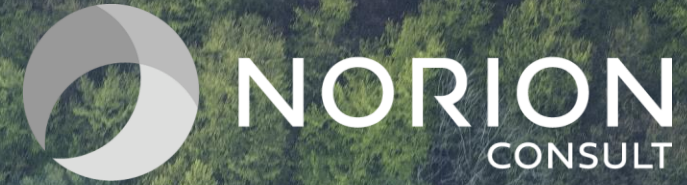
- *mitä ihanteellisesti tulisi seurata,*
- *mitä sidosryhmät katsovat olennaiseksi seurata,*
- *mitä realistisesti voidaan valvoa*

MITÄ IHANTEELLISESTI TULISI SEURATA



- **mitä ihanteellisesti tulisi seurata,**
- *mitä sidosryhmät katsovat olennaiseksi seurata,*
- *mitä voidaan realistisesti valvoa*

CATEGORISED LONG LIST OF INDICATORS (243 INDICATORS)



Theory of change	
Process	<input checked="" type="checkbox"/>
Output	<input checked="" type="checkbox"/>
Outcome	<input checked="" type="checkbox"/>
Impact	<input checked="" type="checkbox"/>

CE Strategy	
1) Function Refuse (R0), Rethink (R1), Reduce (R2)	<input checked="" type="checkbox"/>
2) Product Reuse (R3), Repair (R4), Refurbish (R5), Remanufacture (R6)	<input checked="" type="checkbox"/>
3) Component Reuse (R3), Repurpose (R7)	<input checked="" type="checkbox"/>
4) Material Recycle, downcycle (R8)	<input checked="" type="checkbox"/>
5) Embodied Energy Recover (R9)	<input checked="" type="checkbox"/>
6) Reference e.g. waste generation	<input checked="" type="checkbox"/>

HOW TO USE THE DASHBOARD

Select the inclusion filters you want to apply to the database. The more filters, the more results. If in doubt, select all filters in the category. If no filters are applied to one category, no results will show.

Results will show below as indicator, unit and RACER score.

Read about each variable on the first sheet named "START HERE".

RACER score minimum threshold	
= 5	<input checked="" type="checkbox"/>
≥ 4	<input checked="" type="checkbox"/>
≥ 3	<input checked="" type="checkbox"/>
≥ 2	<input checked="" type="checkbox"/>
≥ 1	<input checked="" type="checkbox"/>

Who is measuring	
Policy makers / Procurers / Public authorities	<input checked="" type="checkbox"/>
Built Environment and Sustainability professionals	<input checked="" type="checkbox"/>
Investors / Property owners / Landlords	<input checked="" type="checkbox"/>

Indicator type			
Qualitative	<input checked="" type="checkbox"/>	Ratio	<input checked="" type="checkbox"/>
Quantitative	<input checked="" type="checkbox"/>	Index	<input checked="" type="checkbox"/>
		Composite	<input checked="" type="checkbox"/>
		Metric	<input checked="" type="checkbox"/>

CE Definition / sustainability dimension		
Sensu stricto	Environmental	<input checked="" type="checkbox"/>
Sensu latu	Economic Social	<input checked="" type="checkbox"/>

Life cycle phase	
Product (A1-A3)	<input checked="" type="checkbox"/>
Construction process (A4-A5)	<input checked="" type="checkbox"/>
Use phase (B1-B5)	<input checked="" type="checkbox"/>
End of lifecycle (C1-C4)	<input checked="" type="checkbox"/>
Benefits and loads beyond the building life cycle (D)	<input checked="" type="checkbox"/>
Other	<input checked="" type="checkbox"/>

Implementation scale		
Micro	<input checked="" type="checkbox"/>	Product / service
Meso	<input checked="" type="checkbox"/>	Building
Macro	<input checked="" type="checkbox"/>	Organisation
		Complex
		City
		Region
		Nation

FILTERING RESULTS: 243 indicators

INDICATOR:	UNIT:	RACER score:
Academic Laboratories involved with research on CE (or sustainability in regard to CE) in the C&D sector (e.g., research in buildings design for CE, research on innovative building materials)	no.	2,8
Accessability for recycling	score	3
Adaptability and flexibility in new buildings	score	3
Adoption of circular business model	scale	1,6
Amount of unrecoverable CDW.	tonnes	3

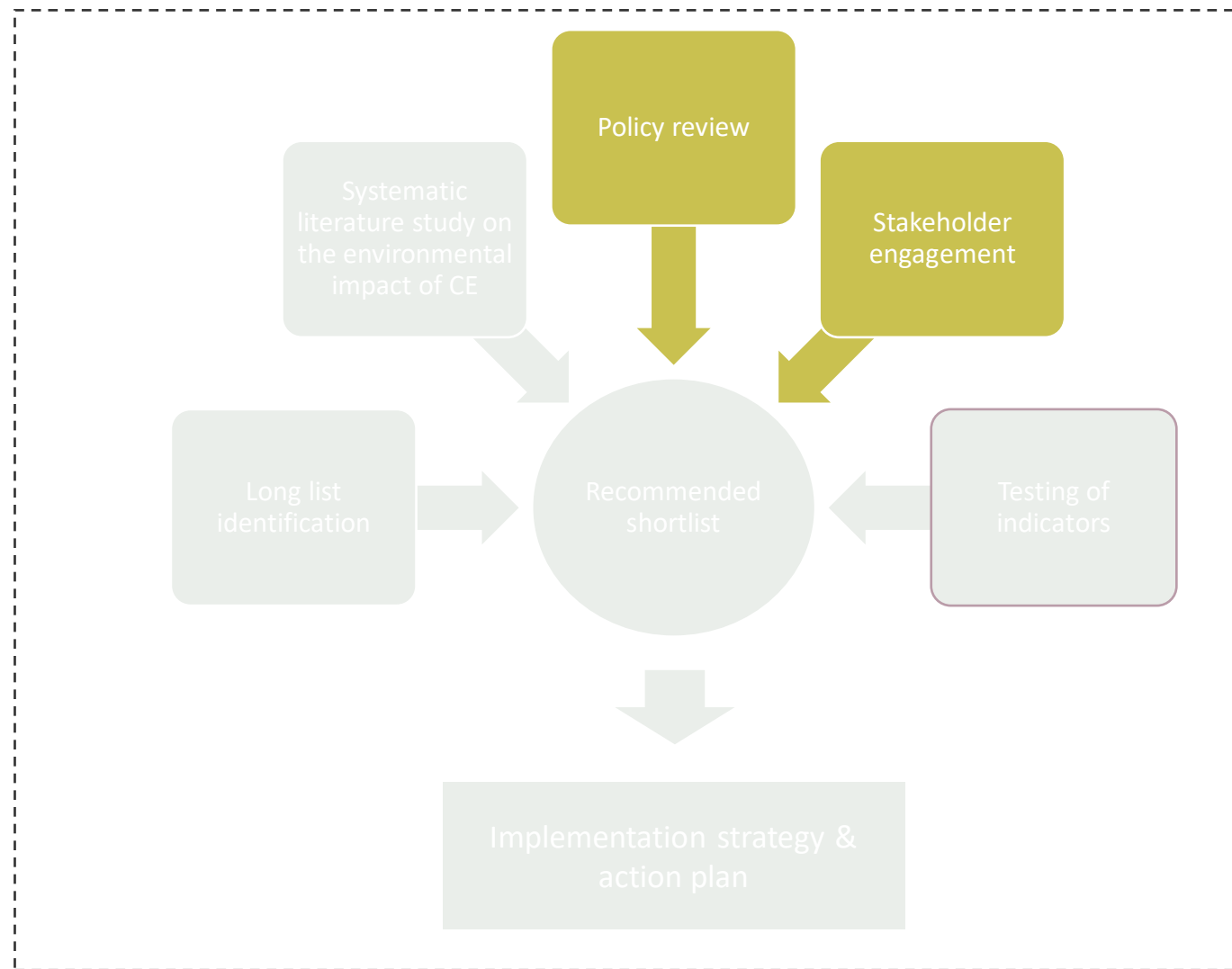
KESKEISET HAVAINNOT KIRJALLISUUSKATSAUKSESTA (1/2)

1. Mahdollisuutta lieventää rakentamisesta aiheutuvia haitallisia vaikutuksia ekosysteemipalveluihin ja biologiseen monimuotoisuuteen kiertotalouden strategioiden avulla ei ole vielä laajasti ja systemaattisesti tutkittu vertaisarvioituissa artikkeleissa.
2. Kokonaisuudessaan yhteys kiertotalouden ja ympäristön välillä mainitaan vain epäsuorasti. Merkittävin potentiaali on hiilipäästöjen, resurssien louhinnan, antroposentrisen maankäytön ja kaatopaikkajätteen vähentämisessä.
3. Suurin osa artikkeleista käsittelee vain kierrätystä. Joissakin artikkeleissa mainitaan uudelleenkäyttö, korvaaminen ja vähentäminen, mutta muita kiertotalouden strategioita ei käsitelty arvioitavissa artikkeleissa.
4. Kiertotalouden ympäristöön kohdistuvan paineen pienennyspotentiaali on yleinen käsitys, joka ei näytä vaativan perusteluja tai viitteitä. Se mainitaan usein artikkeleiden johdanto-osissa.
5. Kiertotalouden strategioiden ympäristöpaineen lieventämisen aste riippuu useista paikallisista tekijöistä, mukaan lukien olemassa oleva maankäyttö ja maanpeite, sekä lajien ja elinympäristöjen toiminnallinen vastaavuus, joita vaikutukset koskevat.

KESKEISET HAVAINNOT KIRJALLISUUSKATSAUKSESTA (2/2)

6. Kemikaaleilla on tärkeitä toiminnallisuuksia rakentamisessa. Ne kuitenkin muodostavat uhan kiertotalouden siirtymälle, koska niitä on vaikea dokumentoida ja seurata kiertotaloudessa, ja samaan aikaan ne aiheuttavat vaaraa biodiversiteetille, ekosysteemeille ja ihmisten terveydelle.
7. Joitakin mahdollisia indikaattoreita rakentamisen biodiversiteettivaikutusten mittaamiseksi ovat
 - ❖ raaka-aineiden tarve (RMR),
 - ❖ maankäyttö ja
 - ❖ biodiversiteetin häviämisen indeksi.
8. Katsauksemme viittaa siihen, että kiertotaloudessa keskitytään tällä hetkellä usein materiaalitehokkuuteen luonnonsuojelun sijaan. Uusiutumattomien resurssien korvaamisessa uusiutuvilla on otettava huomioon, että nykymuotoinen metsäteollisuus asettaa jo merkittävää painetta ekosysteemeille Pohjoismaissa.
9. Jos kiertotalouden strategioita toteutetaan ainoastaan materiaalitehokkuuden näkökulmasta, ottamatta huomioon ekosysteemien ja biologisen monimuotoisuuden säilyttämistä ja hallintaa tai heijastusvaikutusten riskiä, on epätodennäköistä, että biodiversiteettikriisi pysähtyisi. Kirjoittajat esittävät kierto- ja biotalouden yhdistelmää parempana ja palauttavampana vaihtoehtona, jolla toteuttaa luonnollisten elinympäristöjen kestävä hallintaa.

MITÄ SIDOSRYHMÄT KATSOVAT OLENNAISEKSI SEURATA



- *mitä ihanteellisesti tulisi seurata,*
- **mitä sidosryhmät katsovat olennaiseksi seurata**
- *mitä voidaan realistisesti valvoa*

PARADIGM-SHIFT IN EU

Shift from focus on energy in the use phase to a life cycle perspective

Revision of existing legislation, mainly the CPR and Waste Framework Directive

Focus on reporting:

Taxonomy: activities, finance

CSRD: social responsibility

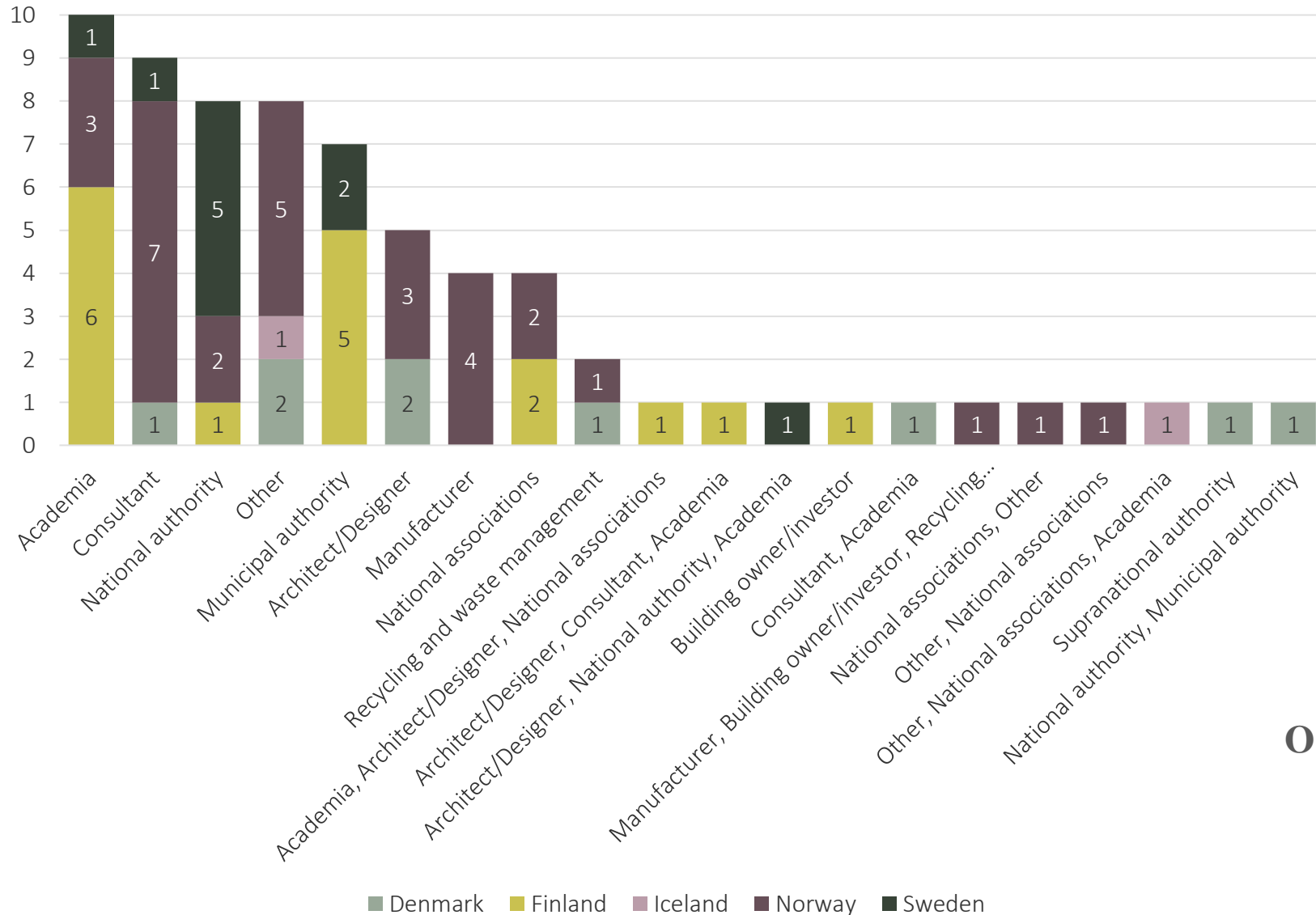
CSDD: value chains

Waste framework directive

Green Claims Initiative

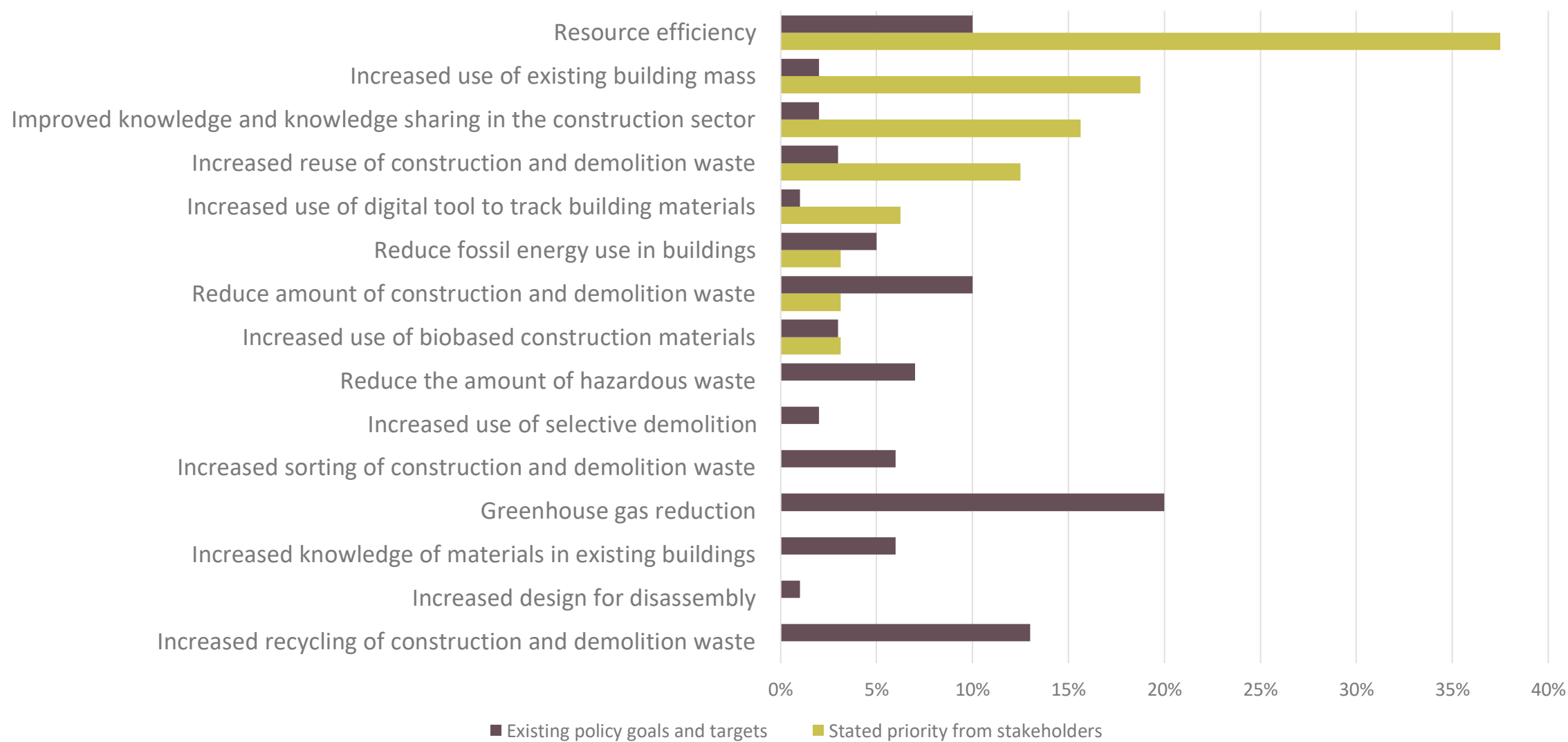
Voluntary schemes and financing opportunities for actual reuse activities

SIDOSRYHMIEN OSALLISTAMINEN

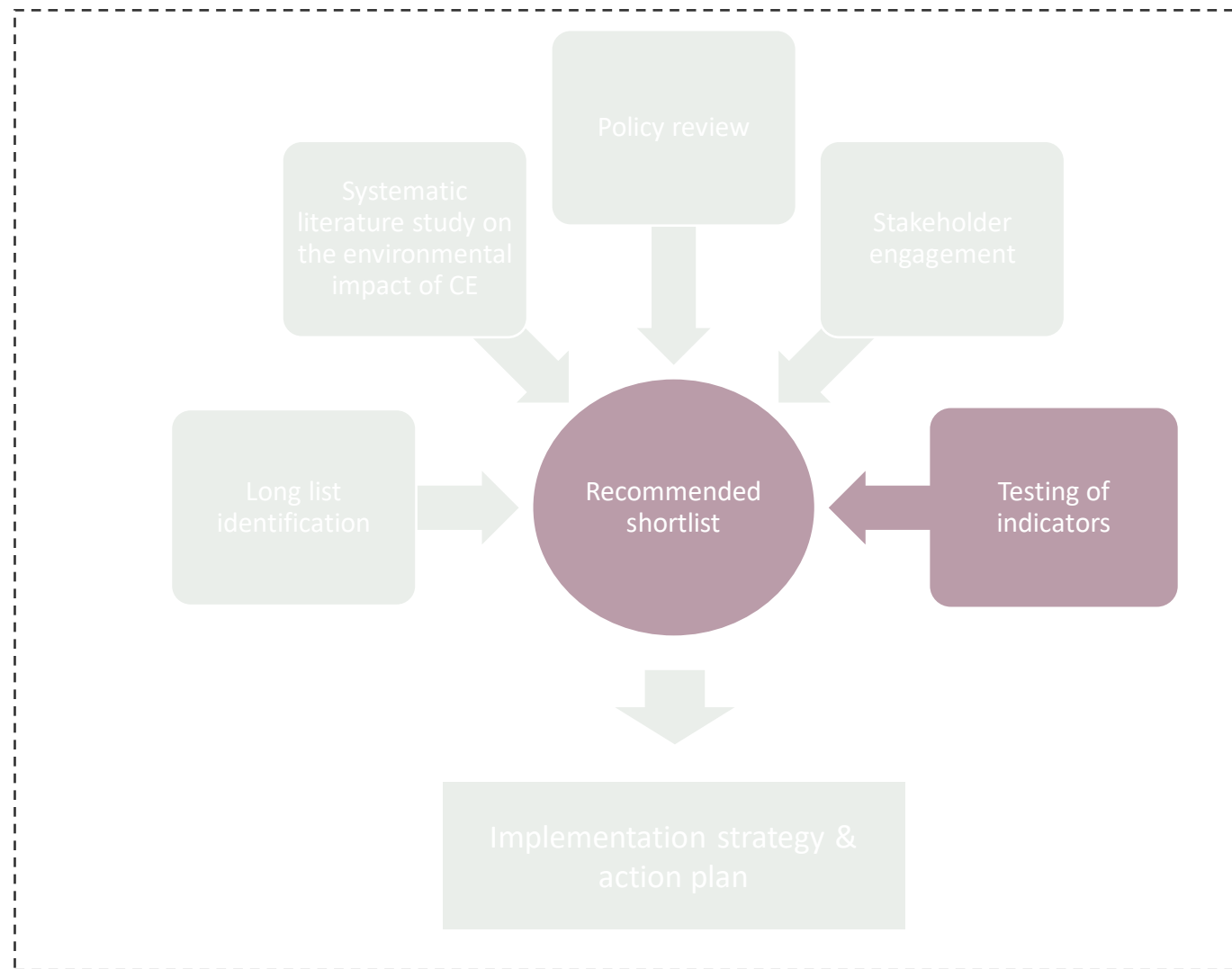


70 PARTICIPANTS REGISTERED TO ONLINE WORKSHOP








Discrepancy between existing Nordic policy goals/targets and stated stakeholder interests



MITÄ VOIDAAN REALISTISESTI SEURATA



- *mitä ihanteellisesti tulisi seurata,*
- *mitä sidosryhmät katsovat olennaiseksi seurata*
- **mitä voidaan realistisesti seurata**








Thematic cluster	Indicators for short term implementation	Indicators for long term implementation
 Utilisation	1 Land use change 2 No. of applications for new construction projects.	3 Utilisation rate of existing building stock
 Renovation	4 Total renovations vs demolition and new buildings	5 Share of rehabilitation projects in line with circular strategies
 Components	6 Number of EPD's for reused materials	7 Life cycle properties of components and materials
 Building projects	8 Share of building projects that are certified 9 Number of EU Taxonomy-aligned buildings (emerging data stream)	10 Life cycle properties of buildings
 Raw materials	11 Resource productivity in construction	
 Waste	12 Construction and demolition waste	13 Proportion of material recycling in relation to total waste
 Energy	14 Carbon footprint of construction	

THE NNCC INDICATOR FRAMEWORK AND ITS COVERAGE OF R-STRATEGIES AND LIFE CYCLE PHASES.

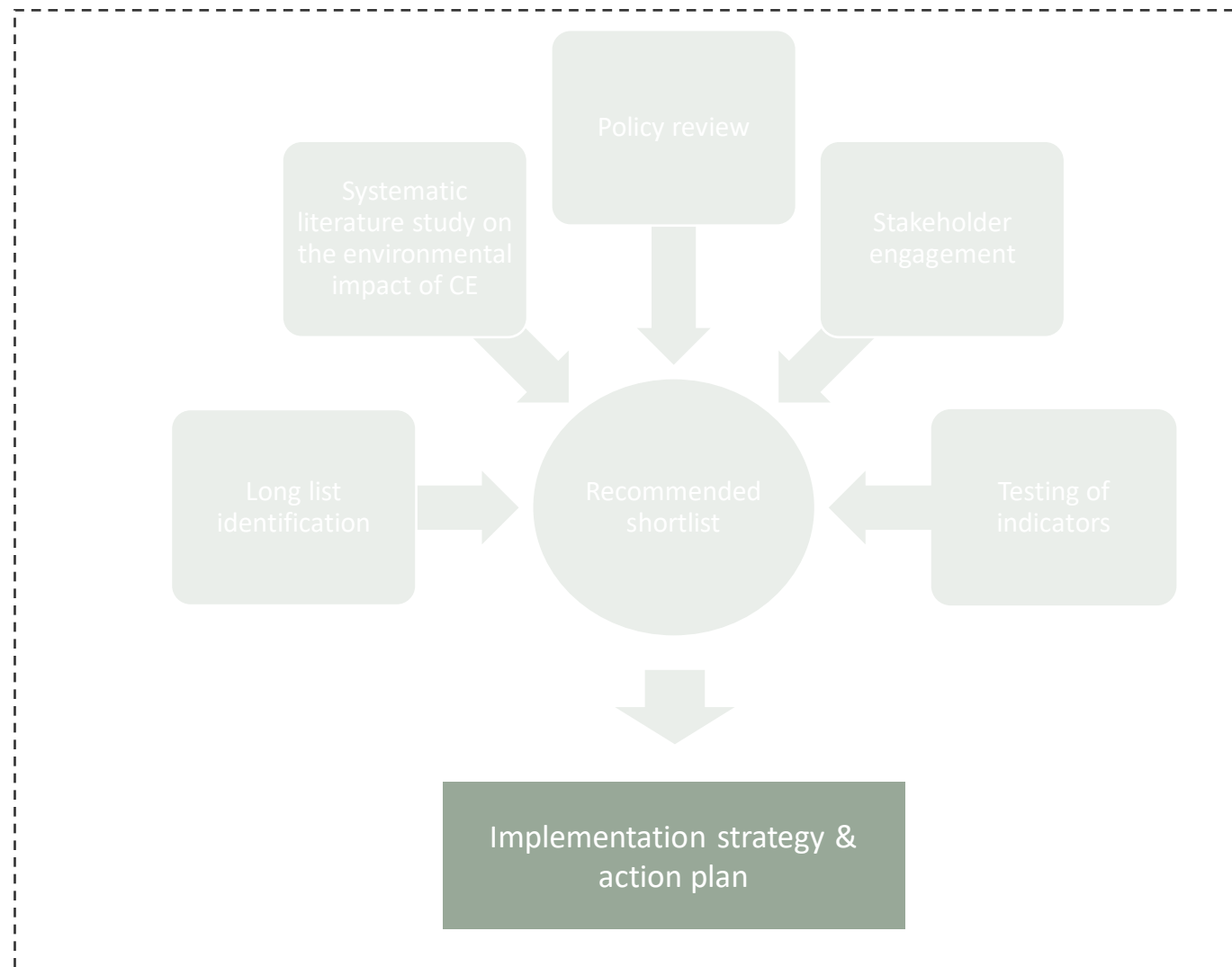
	1: Land use	2: Building applications	3: Utilisation rate	4: Renovations vs demolition	5: Life cycle properties of rehabilitation projects	6: Number of EPDs for reused materials	7: Life cycle properties of components and materials	8: Certified building projects	9: EU Taxonomy-aligned buildings	10: Life cycle properties of buildings	11: Resource productivity	12: Construction and demolition waste (CDW)	13: Recycled CDW	14: Carbon footprint	
RACER average score: (Rated from 1-7)	tba	tba	4,88	4,98	4,02	5,06	4	4,44	5,64	4,12	3,9	4,82	4,62	4,62	
2) Product Reuse (R3), Repair (R4), Refurbish (R5), Remanufacture (R6)															Product (A1-A3)
3) Component Reuse (R3), Repurpose (R7)															Construction (A4-A5)
1) Function Refuse (R0), Rethink (R1), Reduce (R2)															Use (B1-B5)
4) Material Recycle, downcycle (R8)															End of life (C1-C4)
5) Embodied Energy Recover (R9)															Beyond the system (D)
6) Reference e.g. waste generation															

THE NNCC INDICATOR FRAMEWORK AND ITS COVERAGE OF THEORY OF CHANGE AND LEVEL OF IMPLEMENTATION

		1: Land use	2: Building applications	3: Utilisation rate	4: Renovations vs demolition	5: Life cycle properties of rehabilitation projects	6: Number of EPDs for reused materials	7: Life cycle properties of components and materials	8: Certified building projects	9: EU Taxonomy-aligned buildings	10: Life cycle properties of buildings	11: Resource productivity	12: CDW	13: Recycled CDW	14: Carbon footprint			
Processes are activities, e.g., policy responses, workshops, collaborations	Process																Micro	
Outputs are the results of processes, e.g., number of workshops. They may or may not lead to outcomes.	Output																	Meso
An outcome may represent a change in a group of people or organizations such as increased reuse or recycling.	Outcome																	Macro
The impact is the long-term effects on the environment, society and the economy.	Impact																	

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 <p>Energy</p>	<p>14 Carbon footprint of construction</p>	

PROJEKTIN PÄÄTÖSVAIHE





- *mitä ihanteellisesti tulisi seurata,*
- *mitä sidosryhmät katsovat olennaiseksi seurata*
- *mitä voidaan realistisesti seurata*

ethica

Kiitos!

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