Summary slides

Design sprint Czechia – March 21st 2023

Contents

- Key Take aways & To Dos
- References to national legislation
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Key Take aways
Based on the discussions during the Czech design sprint

- **The theme of sustainable buildings** has become political and there are concerns among government officials that WLC-regulation will be costly and provide an additional burden to households. It must be made clear what the benefits are and how other countries in the EU have tackled this.

- **Discussion about the sample of buildings and renovations as part of the archetypes** – besides new buildings the Czech consortium considers also including *renovations* in the scope because of a lack of new building cases and a request from the Czech government. Although renovations are more complex and diverse, it can be included, but the representativeness of the new buildings remains important. This can be ensured by:
  - Considering different structures, materials, energy performance levels, sizes and typologies within the sample

Key Take aways
Based on the discussions during the Czech design sprint

- **Expect 4 typologies on new build:**
  - Family houses (not mandatory to have the bill of quantity)
  - Residential buildings
  - Educational buildings
  - Administrative buildings (for the last three typologies it is mandatory to have bill of quantities).
- It was discussed how to overcome the challenge of not having the complete bill of quantity on family houses when this is an important typology due to the number of new builds. Starting with project specific data on the envelope (which is available) and using averages for internal building parts is a method also used in some front runner countries.

- **A differentiated communication strategy should be** crafted for different stakeholder groups. The idea came up to create a separate message house for policymakers, data partners and other industry professionals. The Czech team and the WGBC can follow up and inform the consortium about the outcome.

Next steps
Based on the discussions during the Czech design sprint

- Coordinate a communication outreach and ensure the Ramboll Reports are properly referenced* (Czech consortium)

- Reach out to Martin with questions related to the sample and method (Czech consortium)

*https://c.ramboll.com/reducing-whole-life-carbon
https://ramboll.com/media/rgr/embodied-carbon-and-how-to-tackle-it

Links to national WLC regulation

- Netherlands
  - Legal reference construction law
    https://rijksoverheid.bouwbesluit.com/Inhoud/docs/wet/bb2012/hfd5/afd5-2#art5.8
  - Calculation method https://milieudatabase.nl/nl/milieuprestatie/bepalingsmethode/

- France
  - Legal reference > "Bâtiments Neufs" on the top header > RE2020
    https://rt-re-batiment.developpement-durable.gouv.fr/re2020-r320.html
  - For guidelines, clarifications, applicability and other resources, select "Bâtiments Neufs" on top header > select RE2020 > select "Accompagnement des Acteurs" or FAQ
- Finland
  - Legal reference https://valtioneuvosto.fi/paatokset/paatos?decisionId=0900908f807d311e and legislative status https://ym.fi/hankesivu?tunnus=YM027:00/2021
  - Calculation method (2019) - https://julkaisut.valtioneuvosto.fi/handle/10024/161796
  - Overview study - https://journal-buildingscities.org/articles/10.5334/bc.30/ and data overview ministry https://ym.fi/vahahiilinen-rakentaminen
- Denmark
  - Legal reference
  - https://bygningsreglementet.dk/Tekniske-bestemmelser/11/Krav/297_298#d578ff9b-87e2-42aa-8d81-a08f60c9b3d1
  - Guidance on building regulations - https://bygningsreglementet.dk/Tekniske-bestemmelser/11/BRV/Bygningers-klimap%C3%A5virkning and knowledge centre with more information https://byggeriogklima.dk/

- Sweden
  - Legal reference - https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-2021787-om-klimatdeklaration-for-byggnader_sfs-2021-787
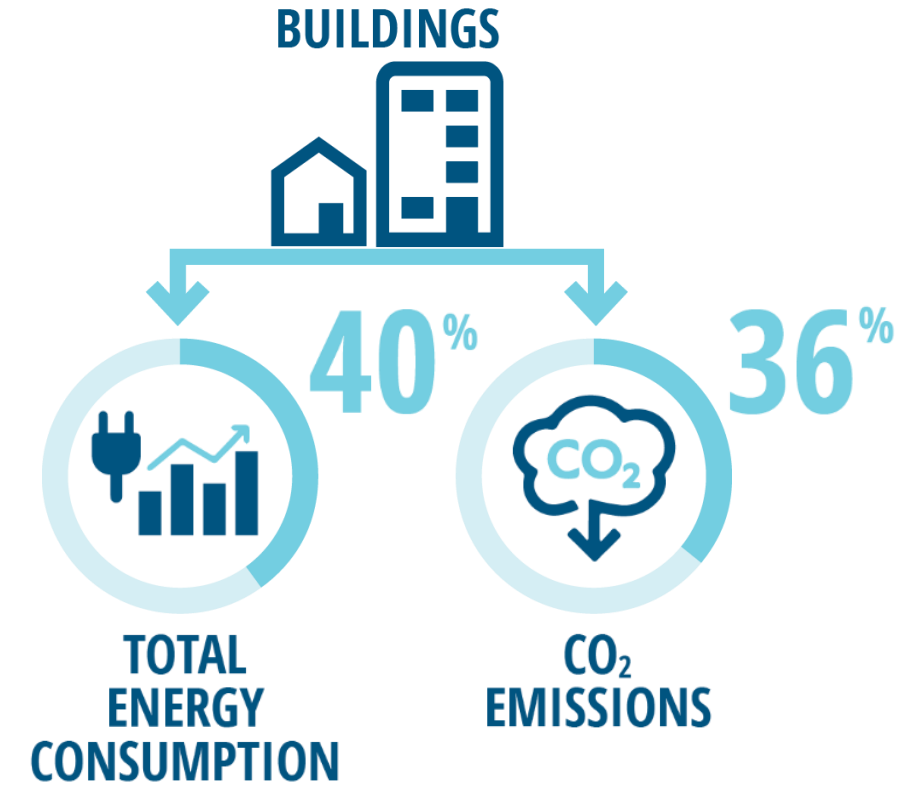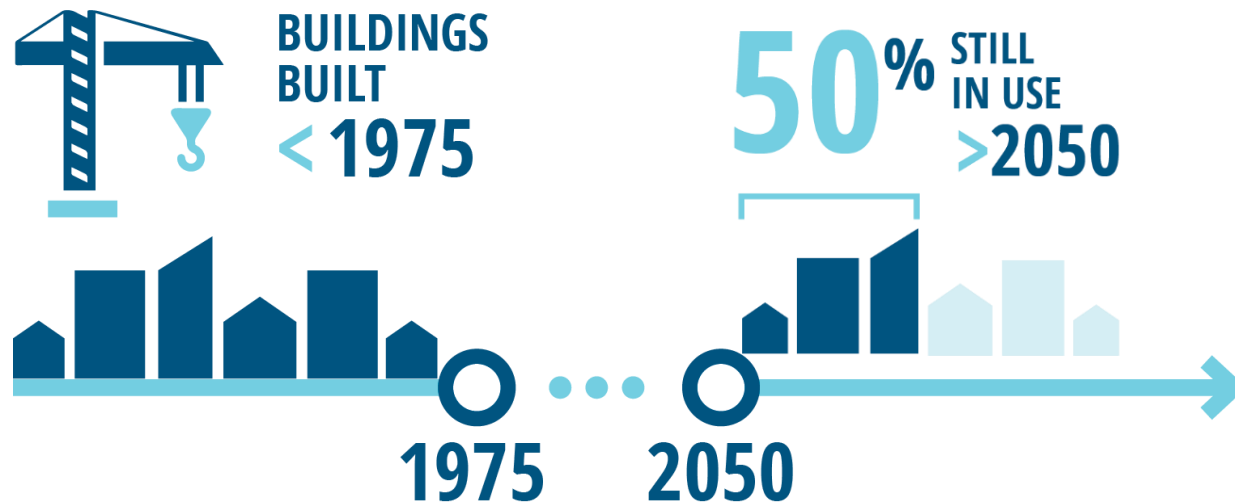 - Guidance from the Housing Authority Boverkets https://www.boverket.se/sv/klimatdeklaration/

Agenda

- Why is Whole Life Carbon important?

- EU Policy Update

- Good Practice examples from frontrunning countries

- Conclusions

Relevance of the building stock

BUILDINGS BUILT < 1975

50% STILL IN USE > 2050

1975 ... 2050

BUILDINGS

40% TOTAL ENERGY CONSUMPTION

36% CO_2 EMISSIONS

- Building sector is responsible for more than one third of the EU´s energy related emissions
- Czechia – 34% of emissions*

INDICATE

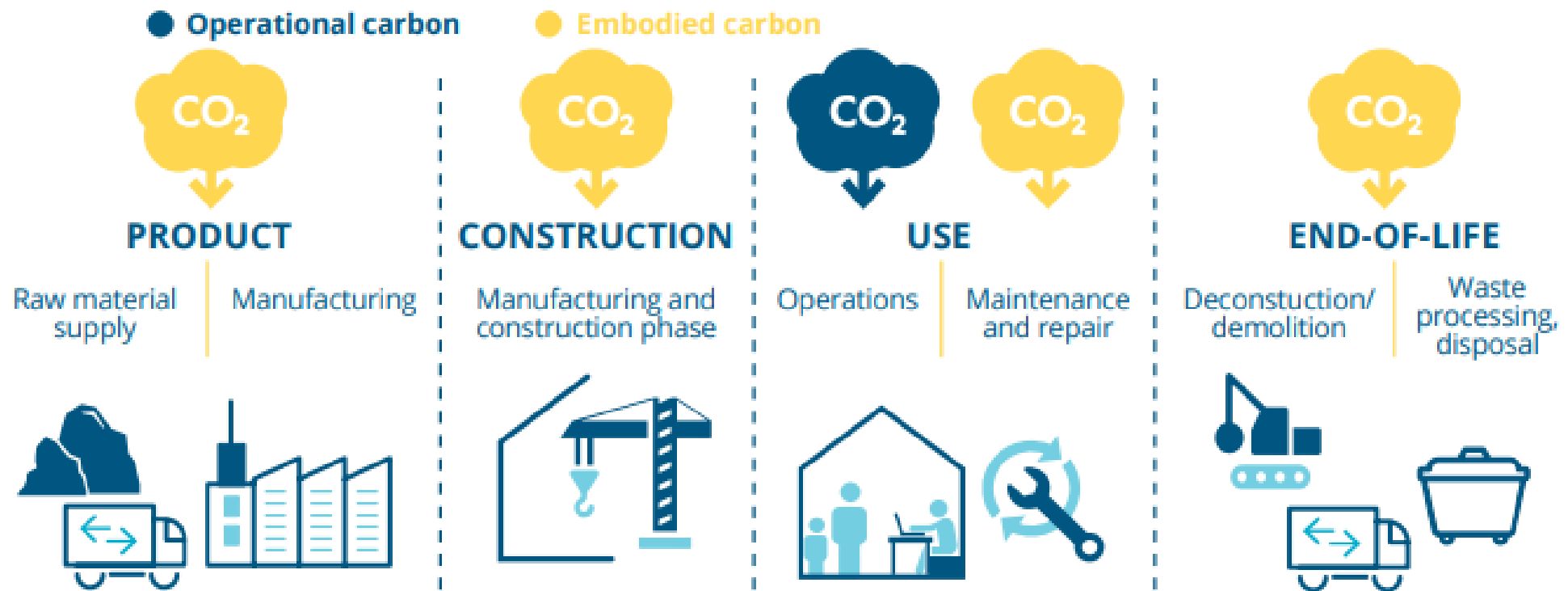# Relevance of the building stock
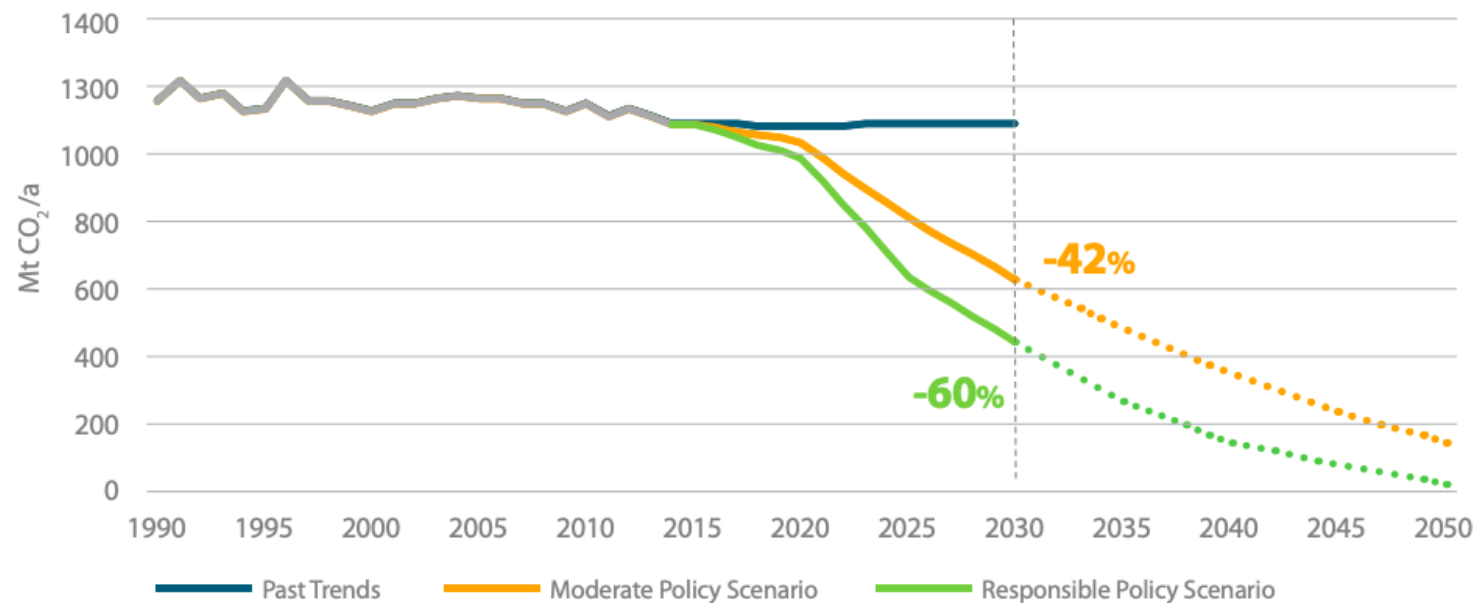
The current deep renovation rate of 0.2%/a needs to grow by at least a factor 10 to 2% and should approach 3% as quickly as possible.
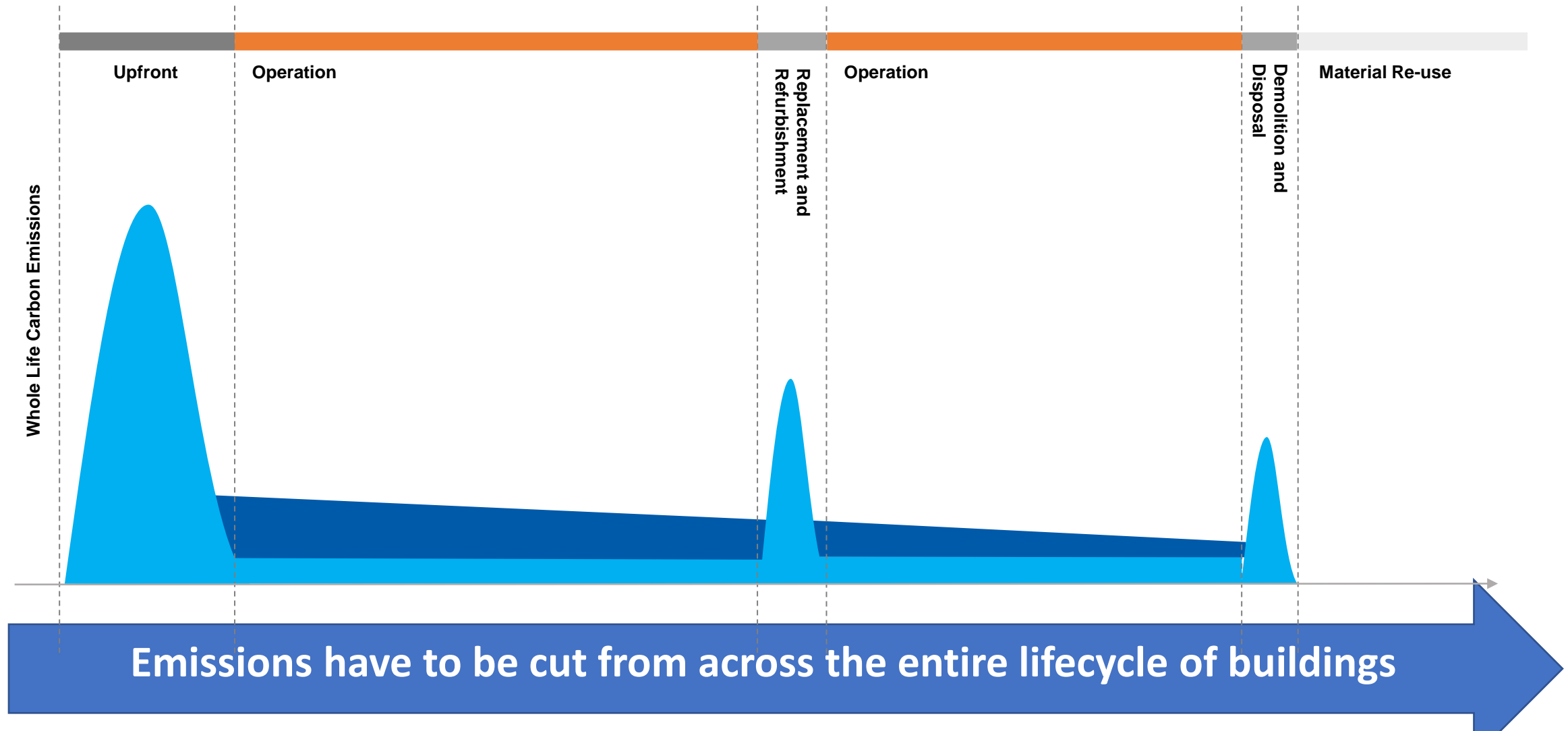
The share of fossil fuels in the energy mix in 2030 has to decrease by 57%.

The renewable heat and electricity share will have to grow to 53% of the final energy demand.

Lifecycle perspective on emissions

Lifecycle perspective on emissions

| Upfront | Operation | Replacement and Refurbishment | Operation | Demolition and Disposal | Material Re-use |

Whole Life Carbon Emissions

Emissions have to be cut from across the entire lifecycle of buildings
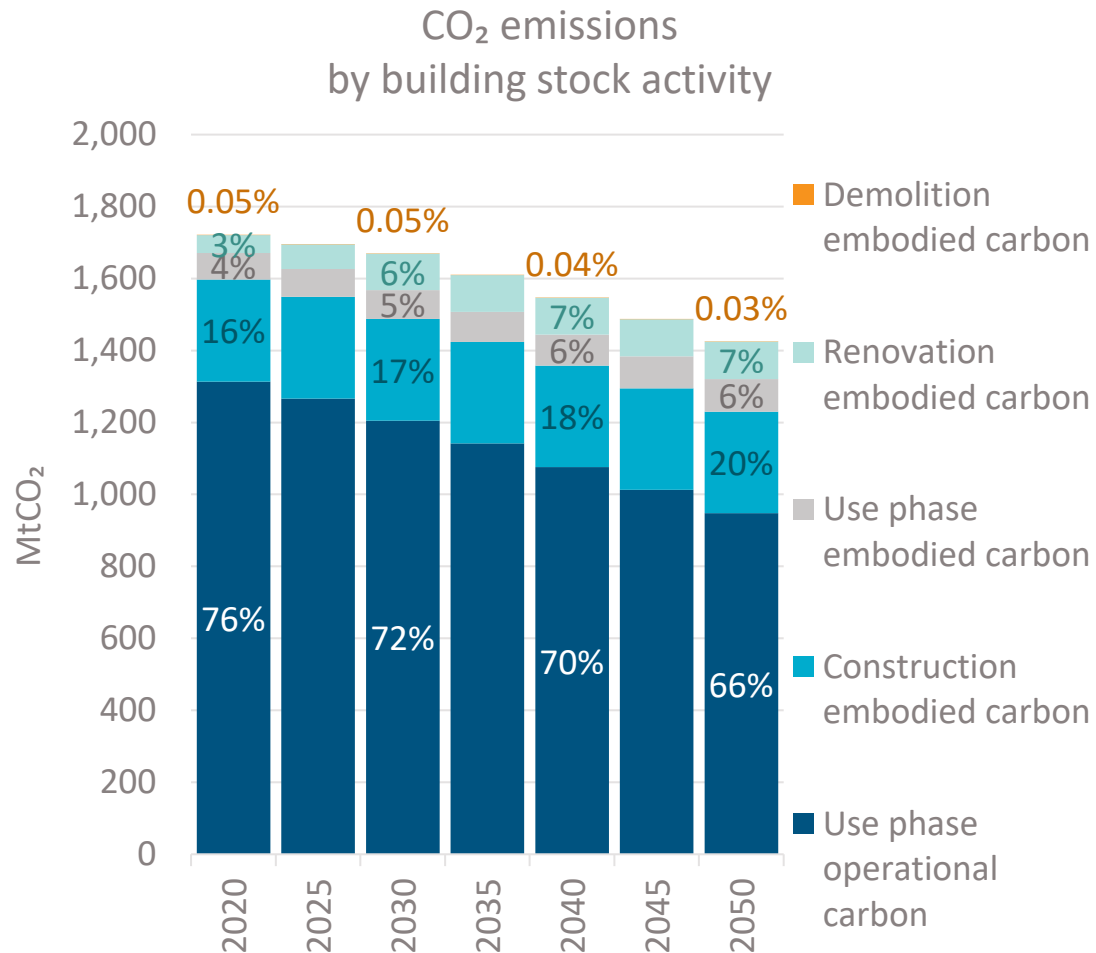
Why focusing exclusively on operational carbon is not enough

Whole life cycle embodied and operational carbon emissions (annualized)
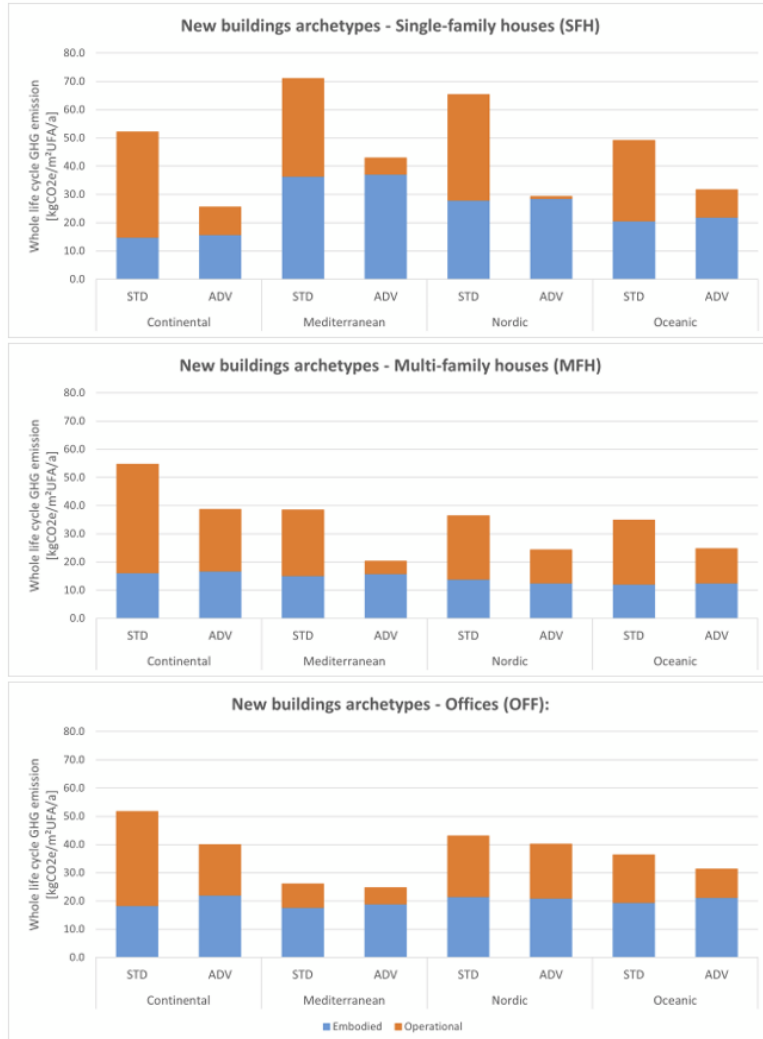
- **Example of Single Family Houses:**
- **Whole life carbon results vary across the regions but are always best for the advanced energy performance variants (ADV)** compared to their standard energy performance counterparts (STD).
- **Relative embodied carbon (EC) contribution to whole life carbon increases for advanced energy performance variants (ADV)** operational carbon (OC) decreases.
- **However limited increases of absolute embodied carbon (EC) are observed for advanced energy performance variants (ADV)** compared to their standard energy performance counterparts (STD)

Looking ahead – if we don't act

INDICATE

CO₂ emissions by building stock activity

MtCO₂ (y-axis)

Legend:
- Demolition embodied carbon
- Renovation embodied carbon
- Use phase embodied carbon
- Construction embodied carbon
- Use phase operational carbon

- Whole life carbon emissions decrease by 17%

  - driven by operational emission reductions

  - reduction about 300 MtCO₂ despite the 40% building stock growth

- 28% savings in use phase operational carbon (366 MtCO₂) are driven by building envelope insulation and space heating decarbonisation fuel switch

- Embodied emissions increase relatively

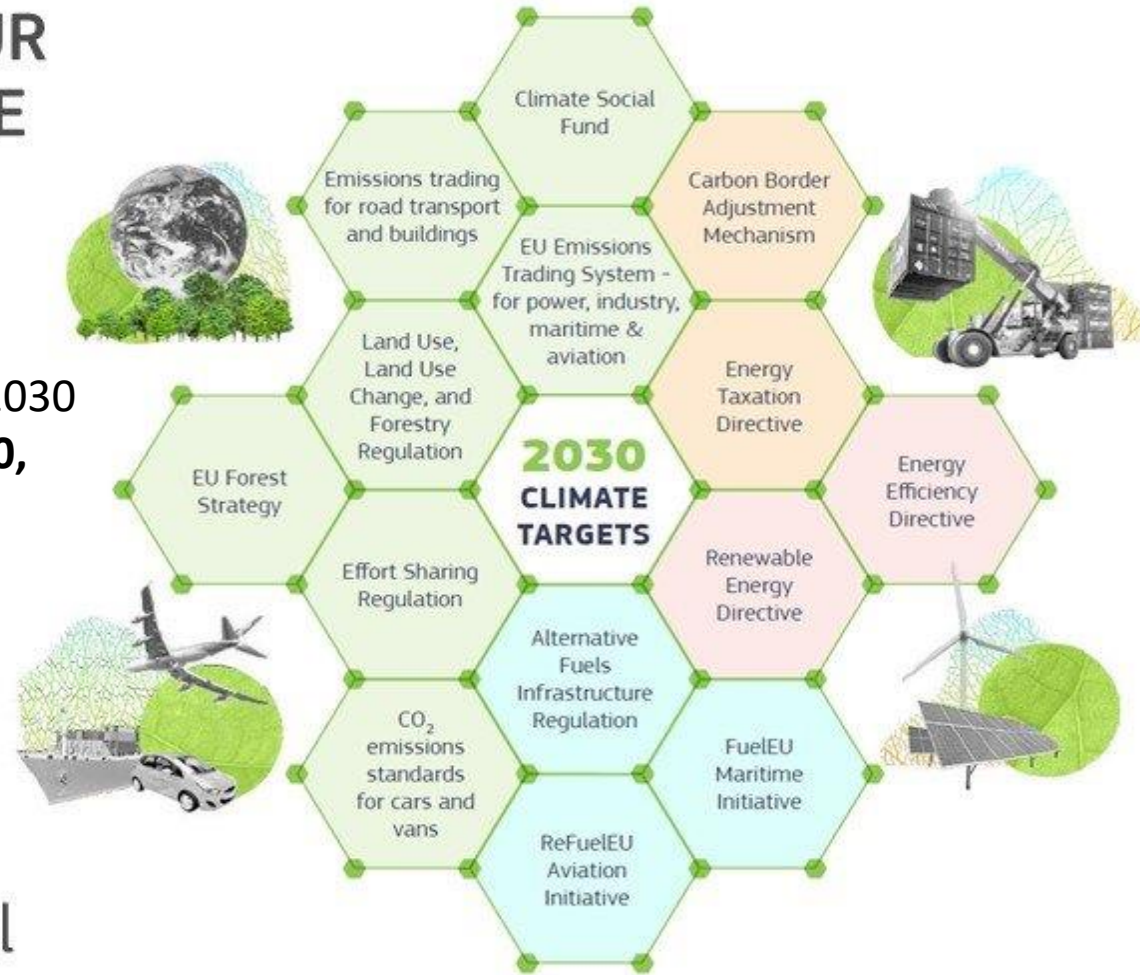- Current efforts insufficient to achieve net zero

The European Green Deal

#EUGreenDeal

- Net zero emissions in 2050
- Economic growth decoupled from resource use

EUROPEAN GREEN DEAL

REACHING OUR 2030 CLIMATE TARGETS

• 55% emission reduction in 2030
• **Building sector -60% in 2030, compared to 2015**

Climate Social Fund

Emissions trading for road transport and buildings

Carbon Border Adjustment Mechanism

EU Emissions Trading System – for power, industry, maritime & aviation

Land Use, Land Use Change, and Forestry Regulation

Energy Taxation Directive

EU Forest Strategy

2030 CLIMATE TARGETS

Energy Efficiency Directive

Effort Sharing Regulation

Renewable Energy Directive

Alternative Fuels Infrastructure Regulation

CO₂ emissions standards for cars and vans

FuelEU Maritime Initiative

ReFuelEU Aviation Initiative

#EUGreenDeal

European Commission

From words to action…

Renovation Wave

- 23 intervention points, a clear timeline (2021-2024)

- Review existing framework (EPBD, EED, RED) and new measures (Building Renovation Passport, MEPS, Building digital logbook)

- **Holistic approach**: energy and whole life cycle performance, renewable energy, decarbonisation of heating and cooling, finance, technical assistance

- **Whole life-cycle performance roadmap to reduce carbon emissions from buildings by 2050**

- Reviewing material recovery targets and supporting the internal market for secondary raw materials

- Success will depend on joined-up thinking, strict implementation and contributions from every actor in the value chain.

EU policy initiatives on WLC in buildings

An incremental approach:

1. First step - Requiring assessment and reporting

2. Second step – setting targets and limit values

Level(s) is the basis on which to bring whole life carbon into building policy.

1) Measurement and reporting requirements

- Spread knowledge and build market capacity

- Generation of data

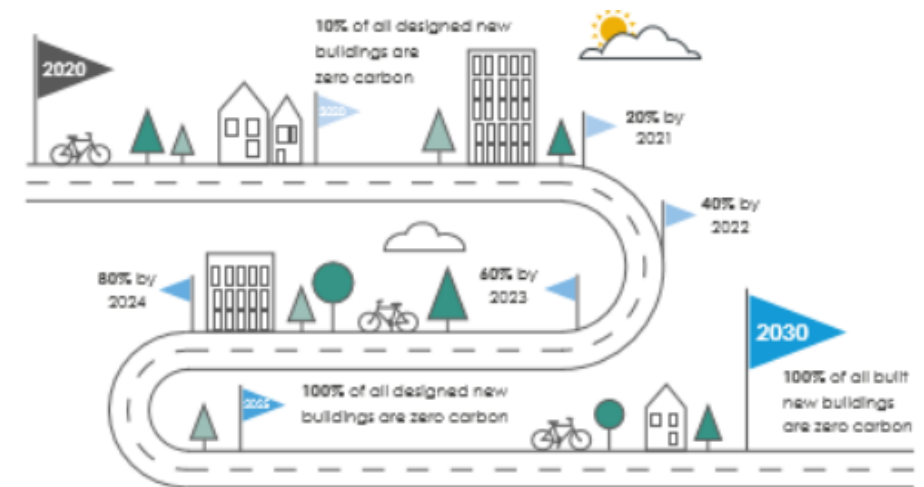- Soft reduction of whole life carbon

- Already in policy initiatives:
  - **Sustainable Finance Taxonomy** – large (>5000m2) new constructions are required to disclose WLC as of January 2022
  - **Energy Performance of Buildings Directive recast** – WLC disclosure requirements from 2027 onwards
  - **Construction Products Regulation** review – information requirements on the products' environmental footprint

Level(s) is the basis on which to bring whole life carbon into building policy.

2) Benchmarks and targets

- Already being developed by EU COM (DG ENV, together with DG Grow):
  - Roadmap for reduction of whole life carbon
    - ✓ Quantified targets, with milestones up to 2050
    - ✓ Embodied and operational carbon
    - ✓ Not a list of policy recommendations

  - ➤ Bringing together expertise and initiatives - inspired by frontrunners – engage across the EU

Reference: LETI CEDG

Process & timeline

EPBD update - WLC

COUNCIL	PARLIAMENT
• New construction to disclose WLC on EPCs as of 1 January 2030 (2027 for buildings over 2000m2 • No provisions for renovations • Annex 3 – calculation methodology with reference to EN15798, Level(s) and CPR	Lifecycle emissions should **progressively** be taken into account, in line with a Union **methodology** to be established by the Commission, starting with **new**, then **renovated** buildings, for which Member States should establish whole life-cycle greenhouse gas emission reduction **targets**.

EPBD update – WLC

| COUNCIL	PARLIAMENT
• New construction to disclose WLC on EPCs as of 1 January 2030 (2027 for buildings over 2000m2 • No provisions for renovations • Annex 3 – calculation methodology with reference to EN15798, Level(s) and CPR	• NBRP with national WLC targets for 2025, 2030, 2035, 2040 • Delegated act by 2025 for the COM to set out WLC methodology • Disclosure requirements for *all* new buildings as of 2027 and *limit values* as of 2030 considering incremental tightening • Existing buildings undergoing major renovations to disclose WLC of building parts • Renovation Roadmaps to outline measures to reduce WLC

Leading EU Member States

- Netherlands (Documentation 2012; limit value 2018)

- France (2021)

- Sweden (2022 Documentation)

- Norway (2022 Documentation)

- Denmark (2022)

- Finland (2023)

- *Germany, UK, Switzerland (WLC requierements for public buildings)*

Diversity of approaches

Typology

- **All new buildings**
  Limit values only apply to new buildings above 1000m2

- All new buildings, except single family houses

- New residential, office and educational buildings

- New residential and office buildings above 100m2

- All new buildings with exemptions for some public buildings and private developers

Process

- Voluntary sustainability class as launch phase with public incentives

- Level(s) pilot phase with small funding support built awareness and capacity

- Voluntary experiment with the possibility to obtain sustainability certification

- Multiple years between legal adoption and entry into force

- Reporting requirement before the introduction of limit values

Limit values

- Mandatory limit values
- 12 kgCO2/m2/year for all buildings in scope for 2023-2025

- Planned mandatory limit values for WLC

- Mandatory limit values, calculated for each building individually
- Current base values: 640 kgCO2/m2 (SFH), 740 kgCO2/m2 (MFH)

- Mandatory limit values expressed as monetary value (environmental shadow price of building materials)
- 1 EUR/m²/year (residential), 0.8 EUR/m²/year (offices)

- Mandatory limit values to be developed for 2027

Frontrunner countries: „key ingredients"
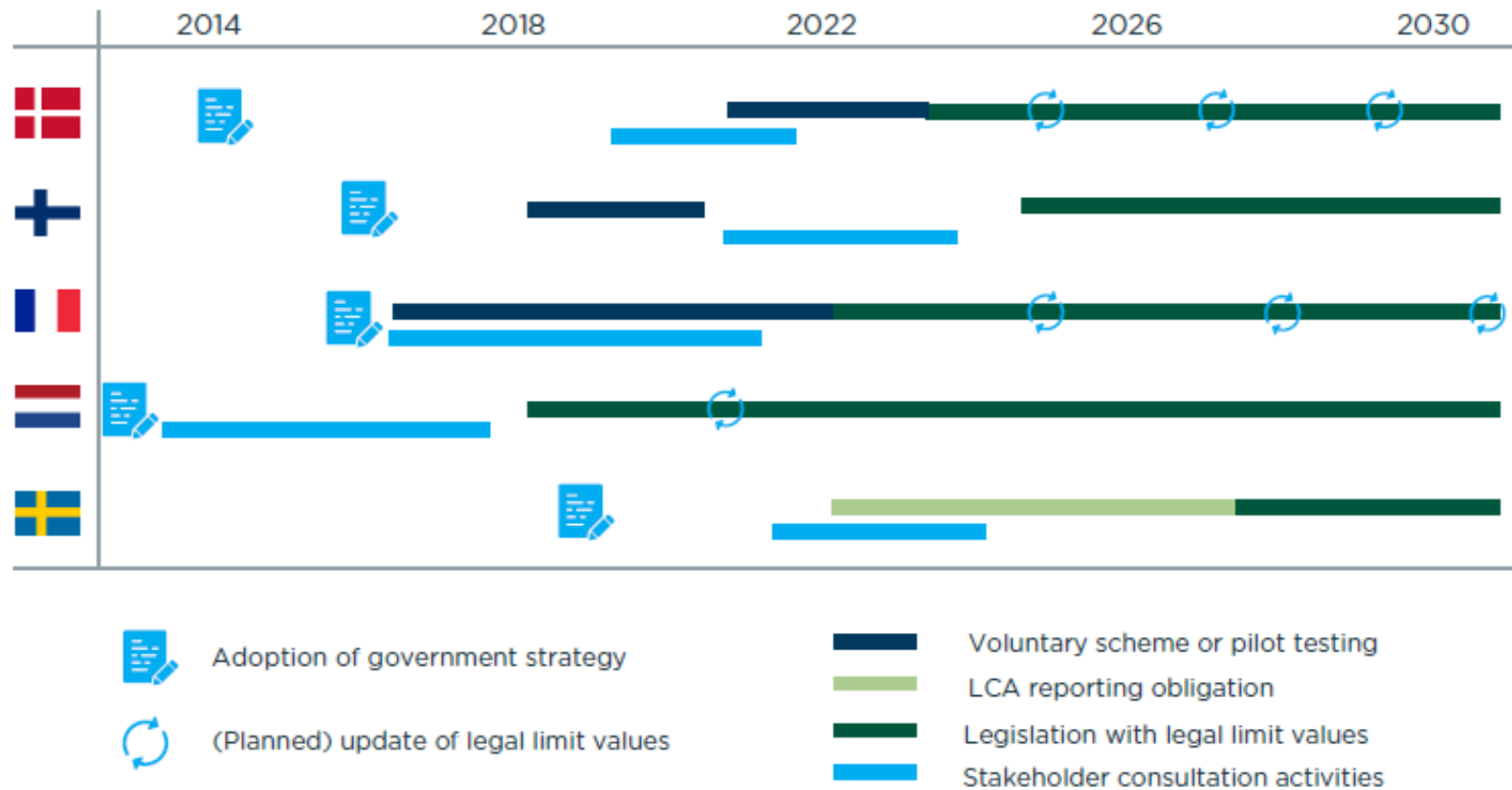
Key ingredients:

- Government strategy
- Stakeholder enagegement
- Voluntary scheme / pilot testing
- **Gradual implementation of legislation**

Source: Rambol / KU Leuven 2023

FINLAND - Timeline

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2017
- CO2 limit values for buildings in low carbon construction roadmap*

2019
- Agreement climate neutrality 2035
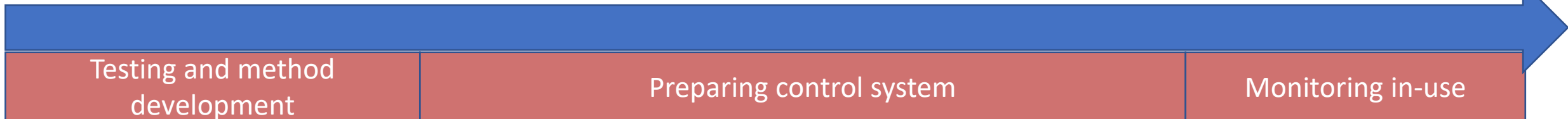- Nordic agreement harmonization LCA approach for buildings

2021-2022
- Legislative preparations**
- Draft Legislative proposal
- Public hearings (1 & 2)

2023
- Land use and Construction Act reform approved

01-2025

Testing and method development	Preparing control system	Monitoring in-use

Testing and method development
- Control system impact assessments
- Development of the carbon footprint calculation model and emissions database
- Know-how and tools
- Testing in public construction projects and in the private sector
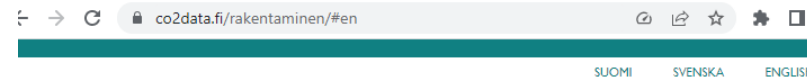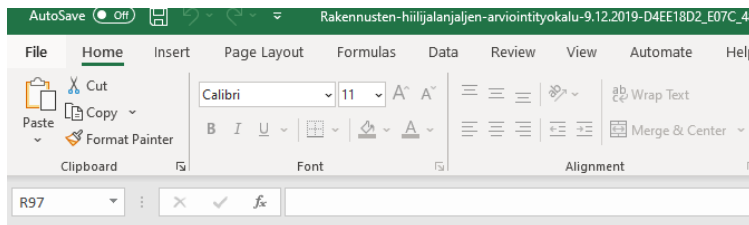
Preparing control system
- Preparation of regulatory guidance and possible incentives (Env Ministry)
- Connection to planning and energy management
- Expansion of pilot projects
- Preparation of building emission data monitoring and statistics

Monitoring in-use
- Possible notification obligation before binding limit values
- The building base can be connected to the control in stages
- Monitoring the emission data of the building stock

FINLAND – Policy landscape

- Calculation tool (.xls)

- Emission database (together with Sweden)

- Collaboration with 100+ industry experts
- Based on existing public information from various sources (RTS EPD, EPD Norge, IBU)*
- Comparison, selection and calculation of averages
- No product specific data
- Three waves of testing – supported with subsidies / beta testing Level(s)

FINLAND

- Assessment method based on Level(s) and EN standards

- Software tools: free tool + market approach (e.g. OCLCA)

- Lessons for method and database development
  - Align with building design practice – user friendly, which stage of the design process is this relevant?
  - Link to digitalization and BIM to avoid redundant work
  - Importance of verification – different consultants and tools should be tested
  - Assessment of different databases – what is required? How to structure the data?
  - Challenge: get small projects online without increasing administrative burden

FINLAND

- Importance international collaboration
  - Nordic Co-Operation
  - Relief to consult government officials with similar struggles
- Stakeholder engagement
  - Empathic approach – understanding concerns is essential
  - Inform in advance – now there is time to adjust
  - Offer subsidies to tackle problems
  - Limit values as enforcement method for laggers

Building Blocks for WLC regulation

Process & Stakeholder engagement (inform, consult, co/create)

Data foundation

Performance definition

additional policy measures

Building blocks of the toolbox INDICATE

Stakeholder engagement

Engaging research/academia

Link to sustainability certification (LEED, BREEAM, DGNB)

Industry collaboration workgroup

Networks / Knowledge exchange

Data foundation

Methods

Data generation (calculation tools)

Data collection & usage (databases, software tools)

Performance definition

Baseline development

Bench-marks

Limit values

Typologies Timeline Trigger points

Budget based approach Relative approach

Additional policy measures

Government strategy

Subsidies / Fiscal incentives

Capacity Building

Portfolio standards

WLC disclosure requirements

Policy synergies
- Circularity programmes
- Extended producer responsibility
- Digital building logbooks
- EPCs
- Green financing / taxonomy
- Local policies (e.g. city strategies)

Takeaways

- Not if, but how to regulate WLC

- Frontrunner countries influence policy development

- Comprehensive EU WLC reporting requirements coming in 2025 (implementation of national methodology) and 2027 start of compulsory reporting

- Data is not yet accurate, but we need action more than precision

- Ensure compliance with future regulation - start measuring, share data and build capacity on WLC data collection and a baseline analysis

Design Sprint Czech Republic

21th of March, 2023

Design sprint agenda

- **Framing** of the design sprint & round of presentations
- **Data** (Martin, KU Leuven)
  - Presentation: Methodological considerations and experience EU Baseline
  - Discussion: Data attributes and representative sample
- Lunch (12.45-13.35)
- **Policy** (Zsolt & Rutger, BPIE)
  - Presentation: recap frontrunner countries and building blocks WLC policy approach – incl. 2-3 in depth examples
  - Workshop: policy landscape and stakeholder mapping
- **Communications** (Miles, WGBC)
- **Operational Support** and Next Steps (Simone, Smith)
- Goodbyes (15.15)

Your design sprint

- Kick-off your work within the INDICATE initiative

- Involve stakeholders in both the discussion on LCA data architecture establishment & policy process

- Discuss how INDICATE partners can support you

We are on a mission!
to decarbonize construction since the building and construction sector accounts for approximately 40% of global carbon emissions

INDICATE

REGULATION

KNOWLEDGE

Drivers to decarbonizing construction

DEMAND

VALUE CHAIN/ INDUSTRY

INDICATE
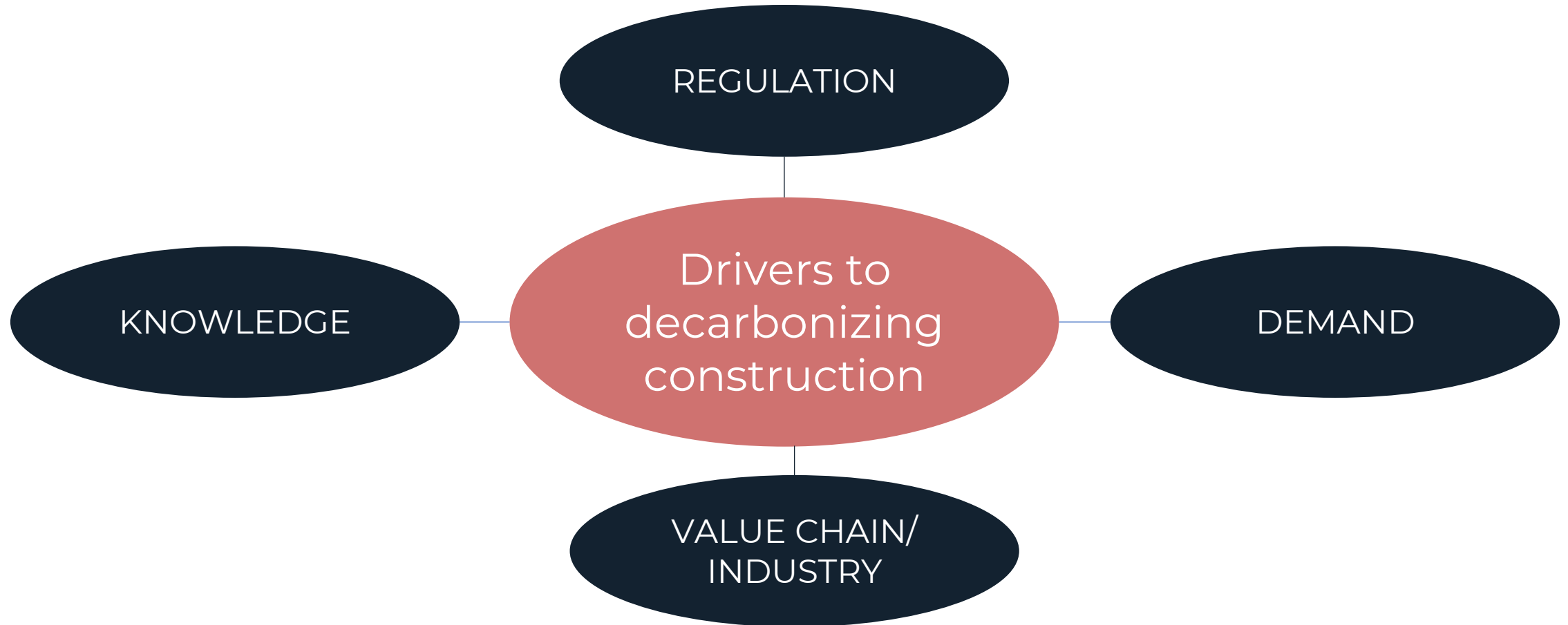
WLC regulation
Supportive regulatory environment

REGULATION

Building LCA methodology
Data generation
Data collection and usage

KNOWLEDGE

Drivers to decarbonizing construction

DEMAND

Investments
Consumer markets
Consumer behaviour

SUPPLY CHAIN/ INDUSTRY

Low carbon supply chain and building materials
New architechtural principles

Creating a push for WLC regulation through knowledge on national building LCA data

INDICATE

REGULATION

INDICATE

KNOWLEDGE

Drivers to decarbonizing construction

DEMAND

VALUE CHAIN/ INDUSTRY
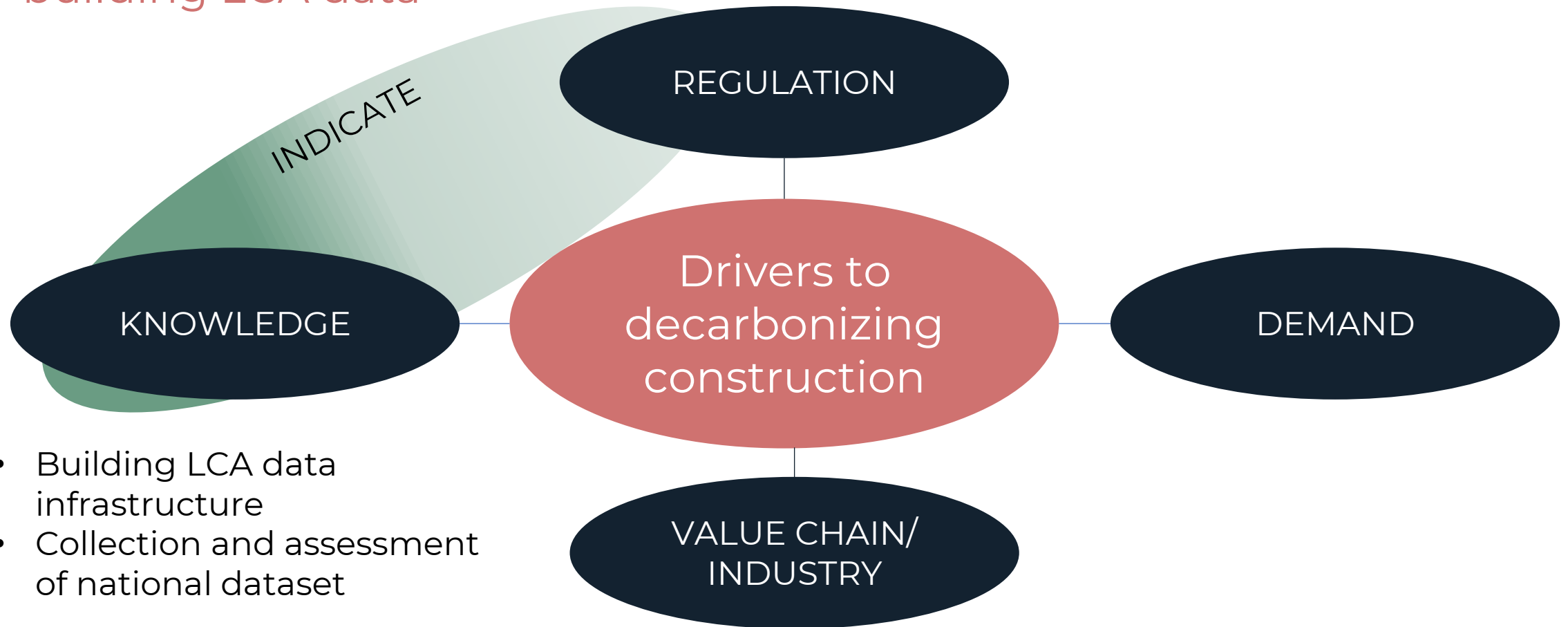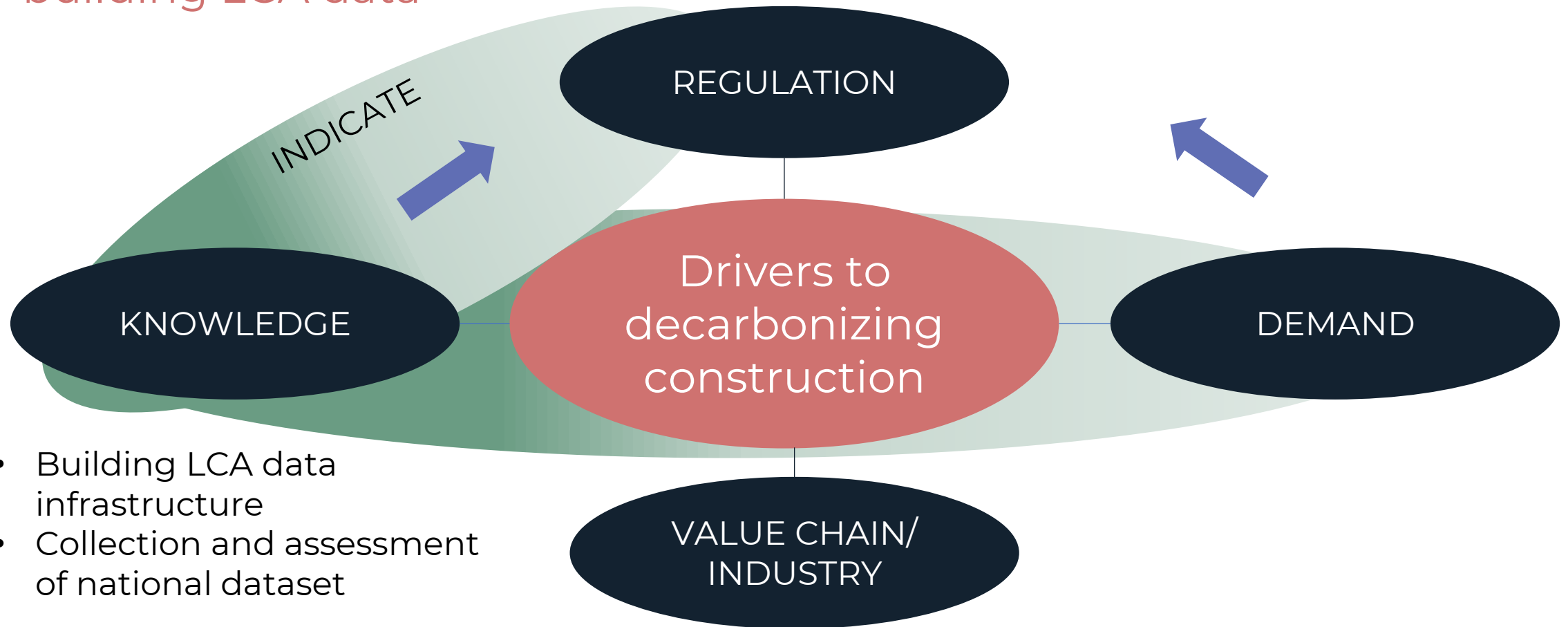
- Building LCA data infrastructure
- Collection and assessment of national dataset

Co-creation is needed
to reduce the carbon footprint of buildings

INDICATE

WLC research institutions

Industry – the entire value chain

Government and public authorities
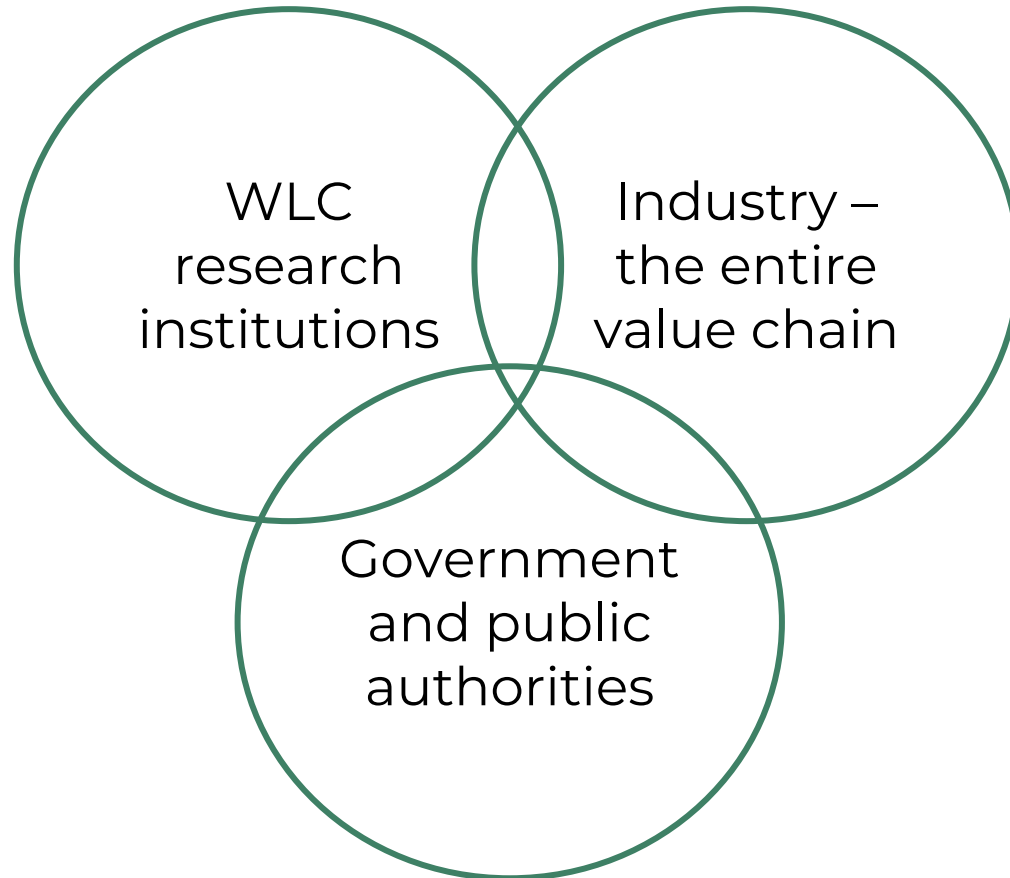
Why INDICATE?

INDICATE

To meet one of the most fundamental challenges to decarbonise buildings – **the lack of data to support policymaking and strategic business decision-making.**

With support from:

Laudes —— Foundation

A philanthropy engaged in decarbonizing construction.

You are a part of a group
Based on experience from front runner countries

INDICATE

Czechia

- Chance for Buildings Alliance
- Czech Green Building Council
- Technical University of Prague

With support from the Ministries of Environment and of Industry and Trade of the Czech Republic.

Ireland

- Irish Green Building Council
- University of Galway & Construct Innovate

With support from the Sustainable Energy Authority of Ireland

Spain

- Green Building Council España
- University of Seville

With the Government of Spain as observers

Round of presentations and aligning expectations

WHAT DO YOU EXPECT FROM THE DESIGN SPRINT?

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Outline

- Introduction
  - Person and projects
  - Why are we collecting data

- Data screening and results
  - Screening for representative data
  - Results of Whole Life Carbon analysis

- Data processing and analysis
  - Data collection (attributes, template)
  - Data processing and analysis (scripts)

- What next?
  - Recommendations
  - Q&A

Martin Röck

Profile (selection)

2023-...	Research Associate, KU Leuven (BE)
2021-2022	Lead Consultant Whole Life Carbon, Ramboll (DK)
2019-2022	Research Fellow, Austrian Academy of Sciences (AT)

Projects (selection)

2022-(2025)	EC: Life Cycle Carbon Reduction and Removal Scenarios (GROW)
2022-(2023)	ECF: EU policy models for reducing WLC of buildings
2020-2022	EC: Whole Life Carbon Roadmap Support Study (ENV)
2020-2022	LF: Towards Embodied Carbon Benchmarks for Europe
2016-2023	IEA EBC Annex 72: Life Cycle Assessment of Buildings
2018-2019	EC Level(s) Pilots: Sustainability Reporting Framework
2013-2016	IEA EBC Annex 57: Embodied Energy & CO_2 Emissions

Why we collect data?

- **Operational energy and carbon emissions already regulated** in Energy Performance of Buildings Directive (EPBD)

- **Increased importance and attention on new buildings' embodied carbon** (material production, construction, renovation, demolition)

- **Embodied carbon >50% of life cycle, dominating mitigation timeframe** (efficiency gains, building complexity)
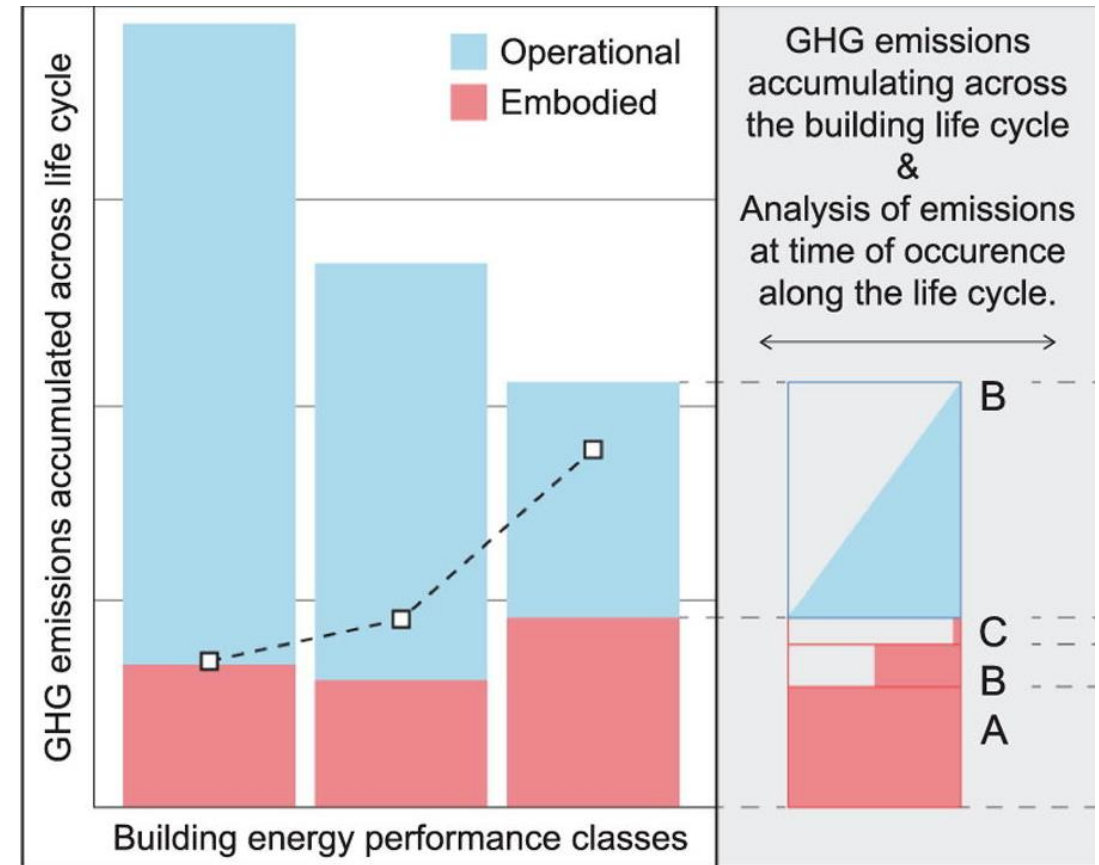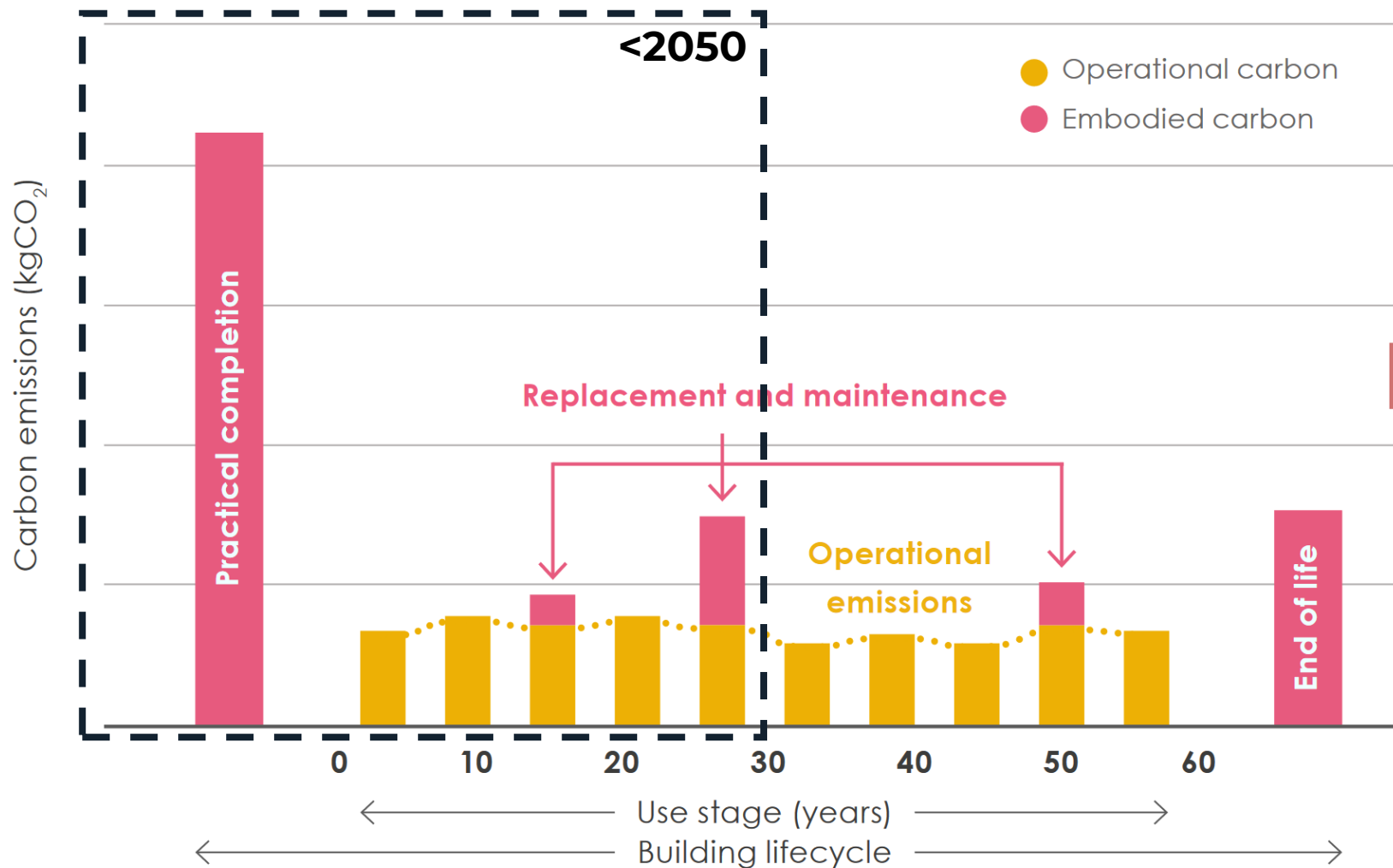
Röck M, et al. "Embodied GHG Emissions of Buildings – The Hidden Challenge for Effective Climate Change Mitigation." Applied Energy, 2020. https://doi.org/10.1016/j.apenergy.2019.114107

Why embodied carbon?

London Energy Transformation Initiative (LETI). "Embodied Carbon Primer - Supplementary Guidance to the Climate Emergency Design Guide," 2020. https://www.leti.uk/ecp.

Why we collect data?

- **Latest EPBD revision draft includes WLC reporting from 2027 onwards** (with gradual implementation)

- **EU frontrunners prepare via WLC data collection and benchmarking** to define baseline values and targets

- **Various EU countries have WLC reporting obligations or even limits** proposed, agreed or in force already

WLC legislation with limit values in force or agreed

Reporting obligation in force, limit values to be proposed

WLC legislation proposed

Other non-legislative LCA requirements in place (e.g. for public buildings or for public fund applications)
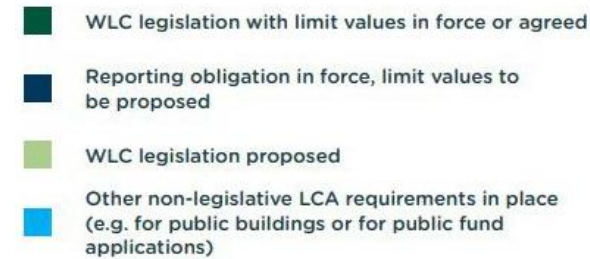
Towards embodied carbon benchmarks for buildings in Europe

What gets measured gets done

RAMBØLL

Bright ideas.
Sustainable change.

Laudes
Foundation

BUILD DEPARTMENT OF THE BUILT ENVIRONMENT AALBORG UNIVERSITY

Towards embodied carbon benchmarks for buildings in Europe – Project outline

#1 What data is available on embodied carbon?
Embodied carbon data availability and quality in the EU

#2 Where are we now?
Setting the baseline based on LCA data

#3 Where do we need to be?
Defining targets according to global carbon budgets

#4 How can we close the gap?
Recommendations for EU performance framework for embodied carbon in buildings

Data screening and results

Data on embodied carbon is largely lacking in most countries
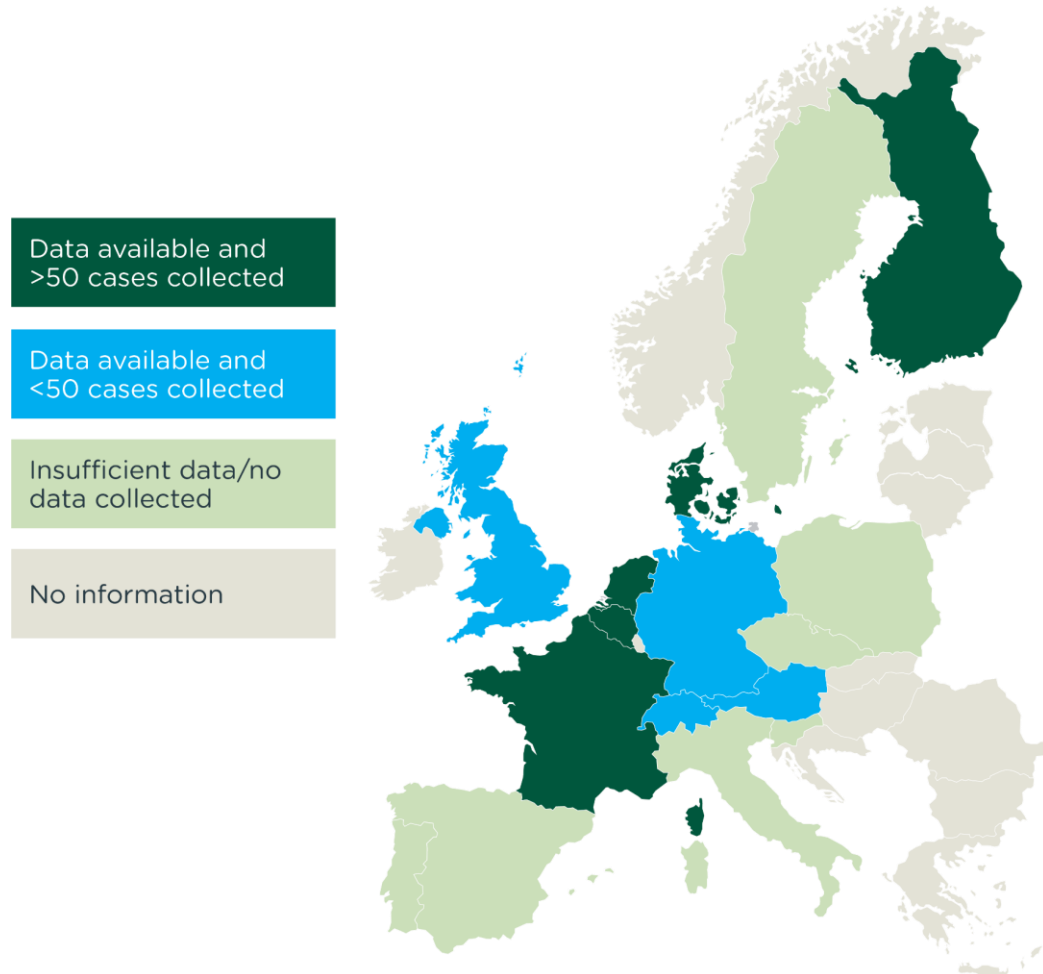
- **Search for EU countries** where >50 cases available
- **Data availability** is a key issue
- **Further challenges:**
  - Representativeness
  - Comparability
  - Accessibility
  - Quality

Data available and >50 cases collected

Data available and <50 cases collected

Insufficient data/no data collected

No information

Private sector

Public sector

Not-for-profits
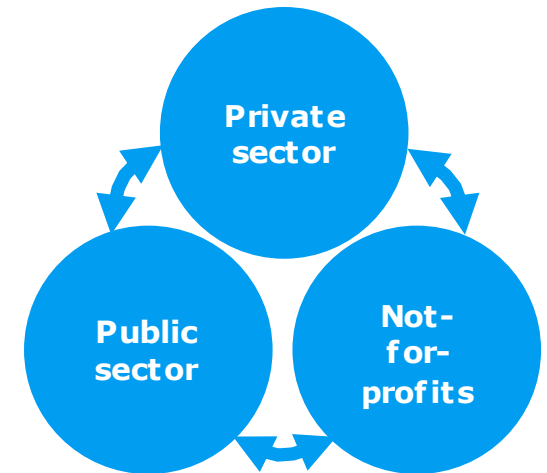
Data sources & partners

- WLC databases and initiatives

- Various countries <50 cases

- Five EU countries >50 cases
  - Belgium
  - Denmark
  - Finland
  - France
  - Netherlands

RICS Embodied Carbon Database	<50 cases AT, UK, CH, Europe
IEA EBC Annex 72 Röck et al. 2020/2021	**>50 cases** Five EU countries: DK, FR, BE, NL, FI = **EU-ECB dataset**
Carbon Leadership Forum (Europe)	
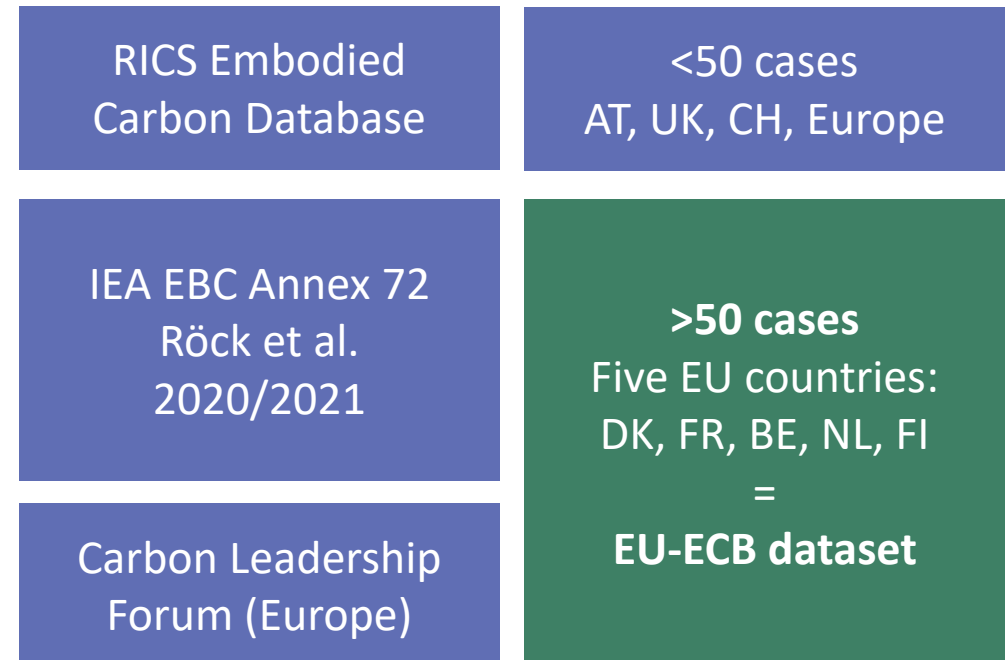
Data sources & partners

- Ministry (Infrastructure, Technology, Buildings, etc.)
  - Support data collection to inform own policy development
  - Synergies w/ overall digitalization efforts (e.g. building permits)

- Green Building Alliances (e.g., local GBC)
  - Help identify key stakeholders and partners
  - Leverage networks to identify and mobilize data partners

- Industry partners, consultancies, academia
  - With LCA/WLC experience, willing to share in-house data
  - Contract to generate new data on representative WLC cases

Dataset composition

Number of cases per country and by building typology:

Typology	BE	DK	FI	FR	NL	EU-ECB
Non-residential	-	34	31	27	18	110
Residential	105	38	28	434	29	634
All types	**105**	**72**	**59**	**461**	**47**	**744**

Embodied carbon matters: 2/3 occur as upfront carbon spike

Embodied carbon from other life cycle stages

600

kgCO$_2$eq/m^2

Average embodied carbon

67% upfront embodied carbon

10m^2

=
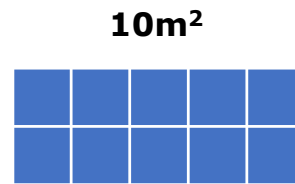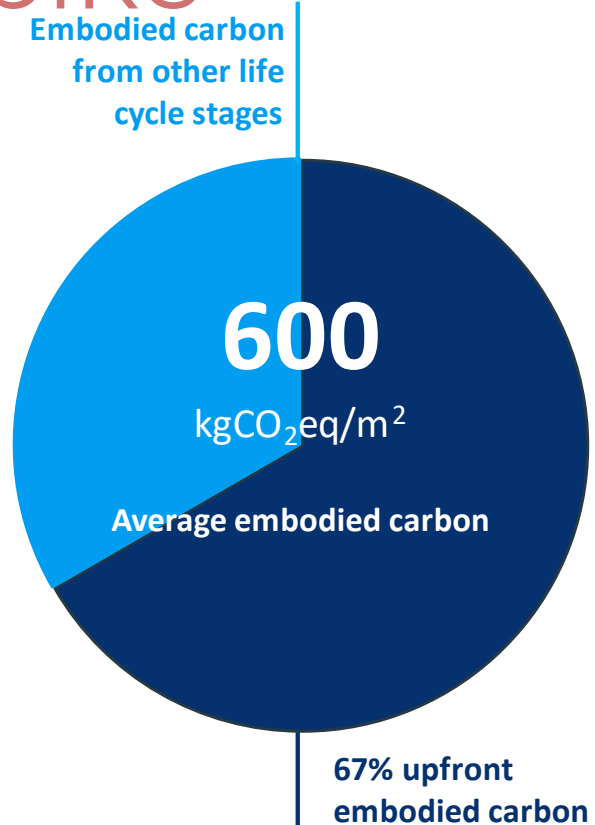
1 EU citizen's annual carbon footprint

Röck M, et al. "Towards Embodied Carbon Benchmarks for Buildings in Europe - #2 Setting the Baseline: A Bottom-up Approach.", 2022. https://doi.org/10.5281/zenodo.5895051.
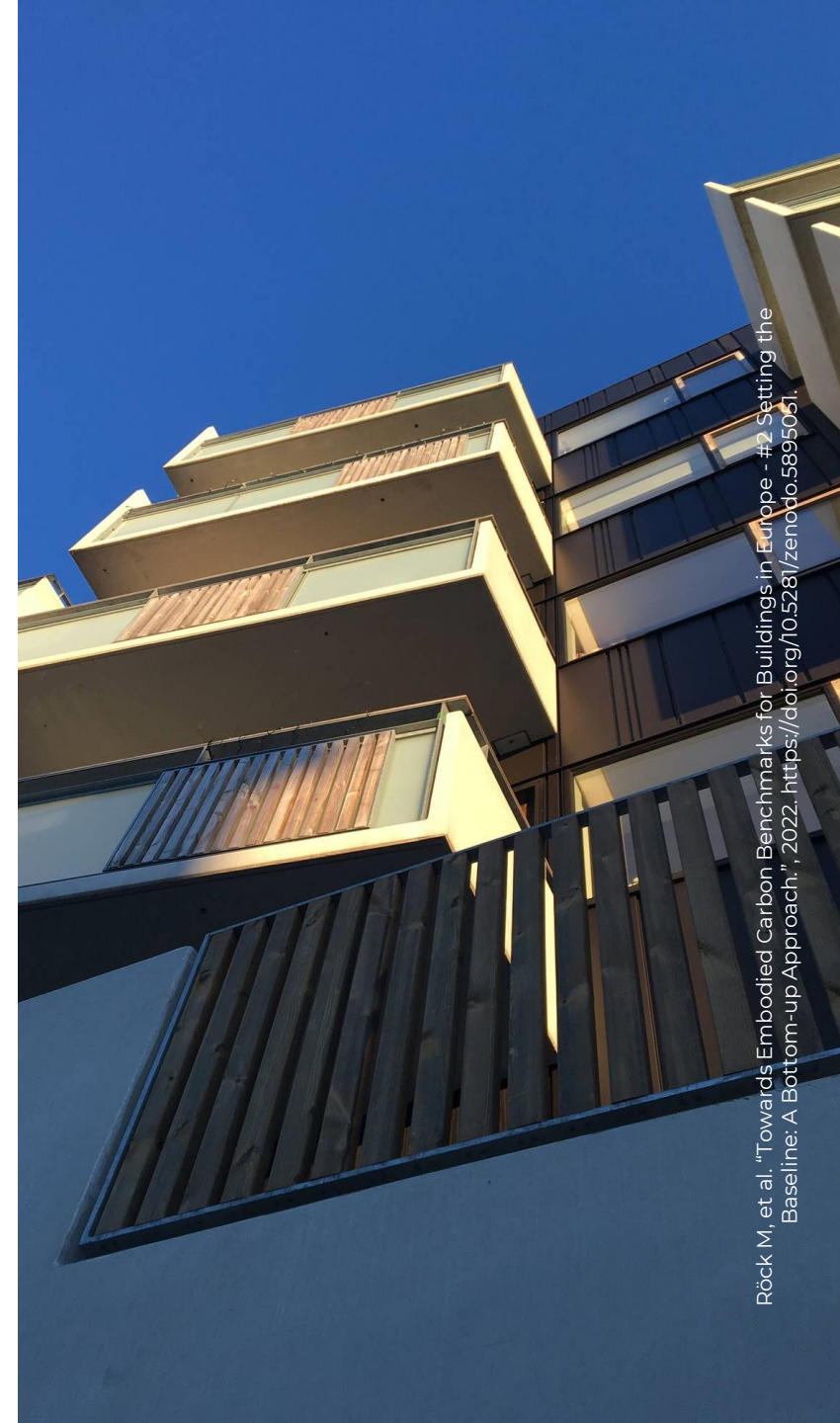
Building typology shapes embodied carbon levels and intensity of use drives carbon footprint per capita

Life cycle embodied carbon per square meter (m²)
In kg of CO_2e per m²

Averages

600
kgCO_2e/m²

m²

600
kgCO_2e/m²

Residential buildings

Non-residential buildings

600
kgCO_2e/m²

700
kgCO_2e/m²

600
kgCO_2e/m²

750
kgCO_2e/m²

Single-family house

Multi-family house

Office building

School and daycare
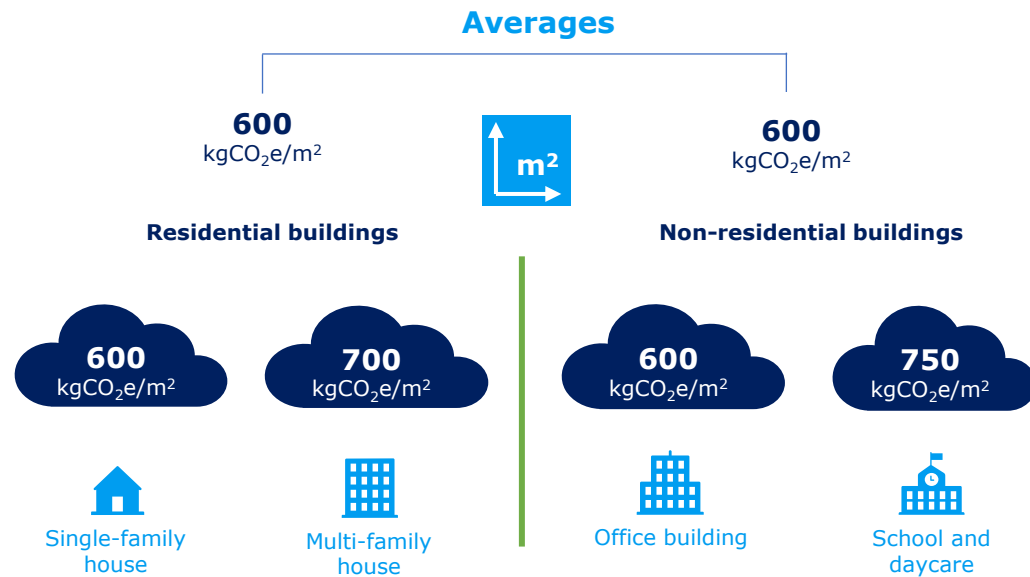
Life cycle embodied carbon per capita (cap)
In tons of CO_2e per cap

Averages

32
tCO_2e/cap

20
tCO_2e/cap

Residential buildings

Non-residential buildings

33
tCO_2e/cap

26
tCO_2e/cap

24
tCO_2e/cap

10
tCO_2e/cap

Single-family house

Multi-family house

Office building

School and daycare
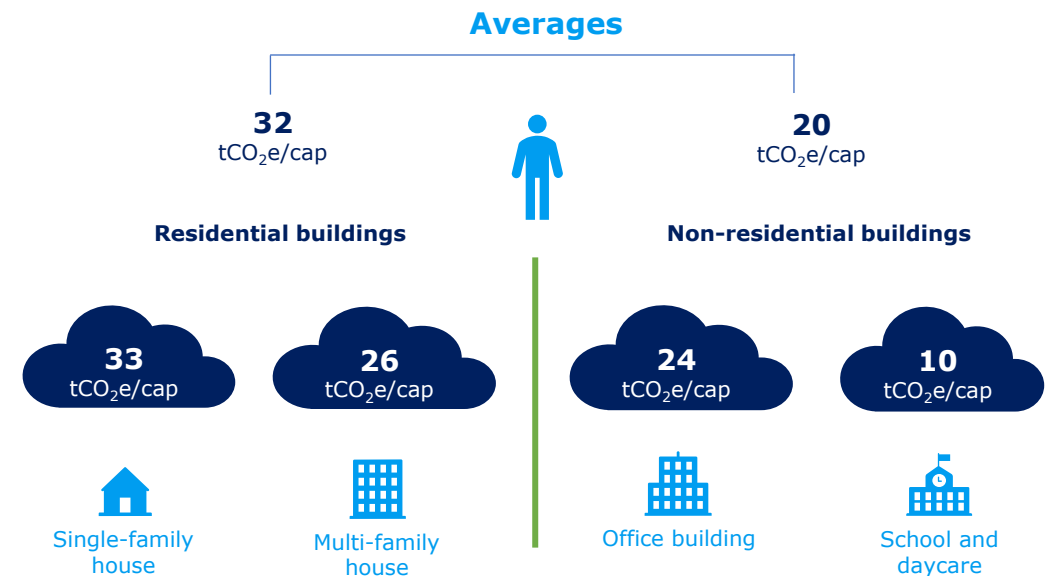
Reference values for different building types, showing EC contribution across life cycle stages

Embodied carbon per m² (harmonized) by building use subtype for EU-ECB
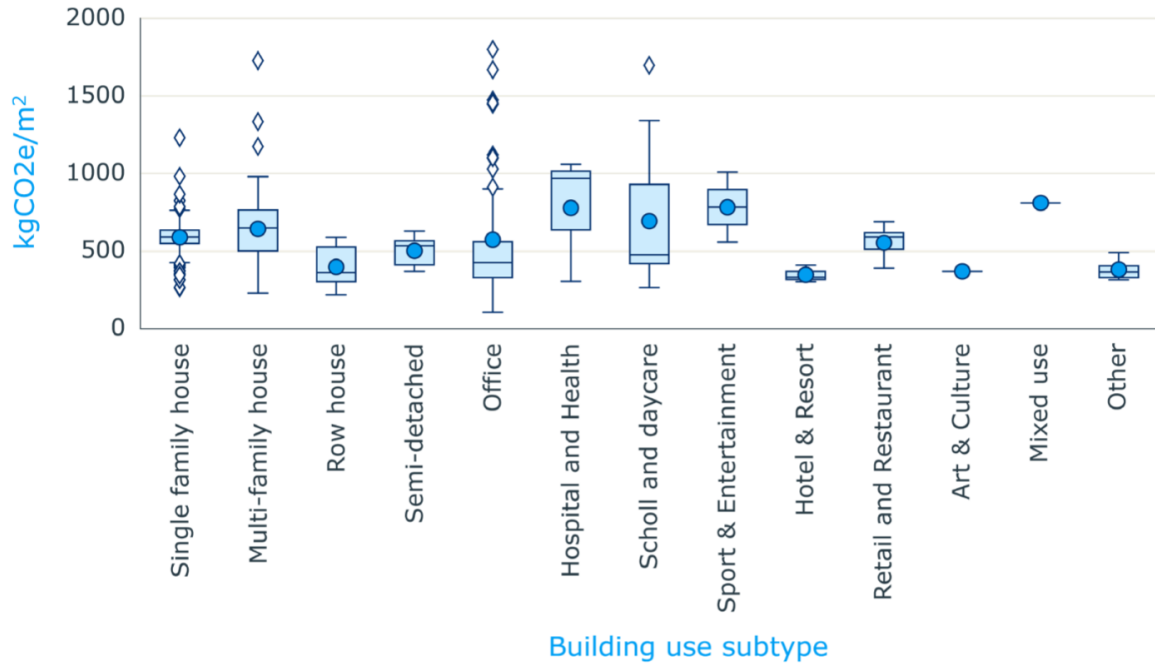
Embodied carbon of life cycle stage for EU-ECB cases

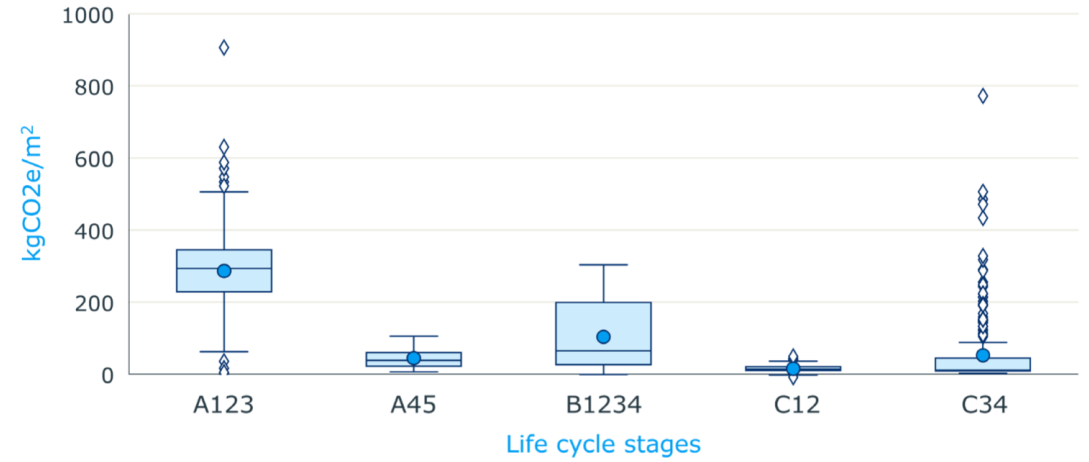Röck M, et al. "Towards Embodied Carbon Benchmarks for Buildings in Europe - #2 Setting the Baseline: A Bottom-up Approach.", 2022. https://doi.org/10.5281/zenodo.5895051.

Building structure and material choices also shape embodied carbon levels and contribution of building parts

500
kgCO$_2$e/m^2

Wood frame building

750
kgCO$_2$e/m^2

Massive concrete building
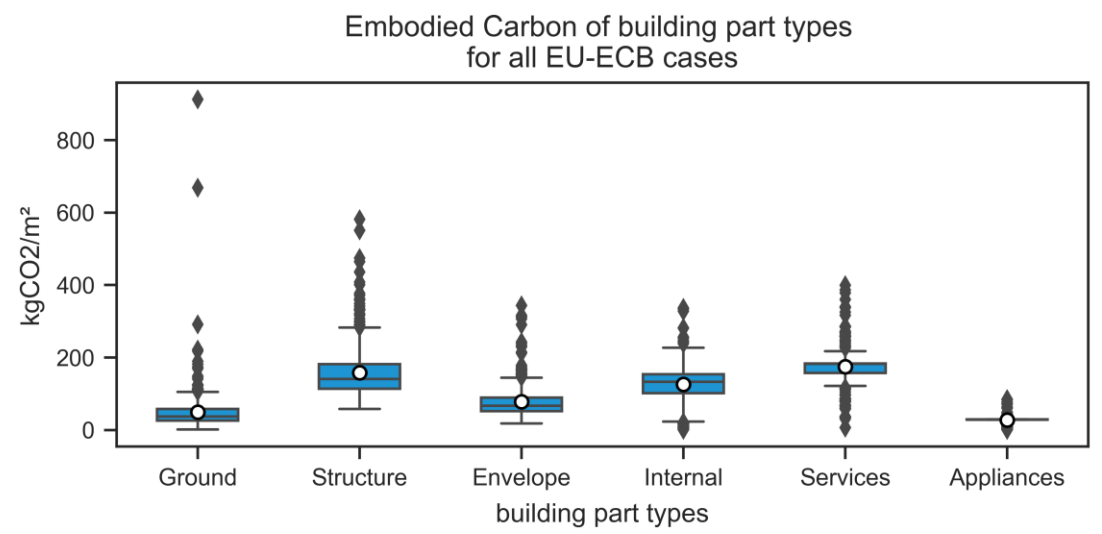
Embodied Carbon of building part types
for all EU-ECB cases

kgCO2/m²

Ground Structure Envelope Internal Services Appliances

building part types

Towards embodied carbon benchmarks for buildings in Europe – Project outline

#1 What data is available on embodied carbon?
Embodied carbon data availability and quality in the EU

#2 Where are we now?
Setting the baseline based on LCA data

#3 Where do we need to be?
Defining targets according to global carbon budgets

#4 How can we close the gap?
Recommendations for EU performance framework for embodied carbon in buildings
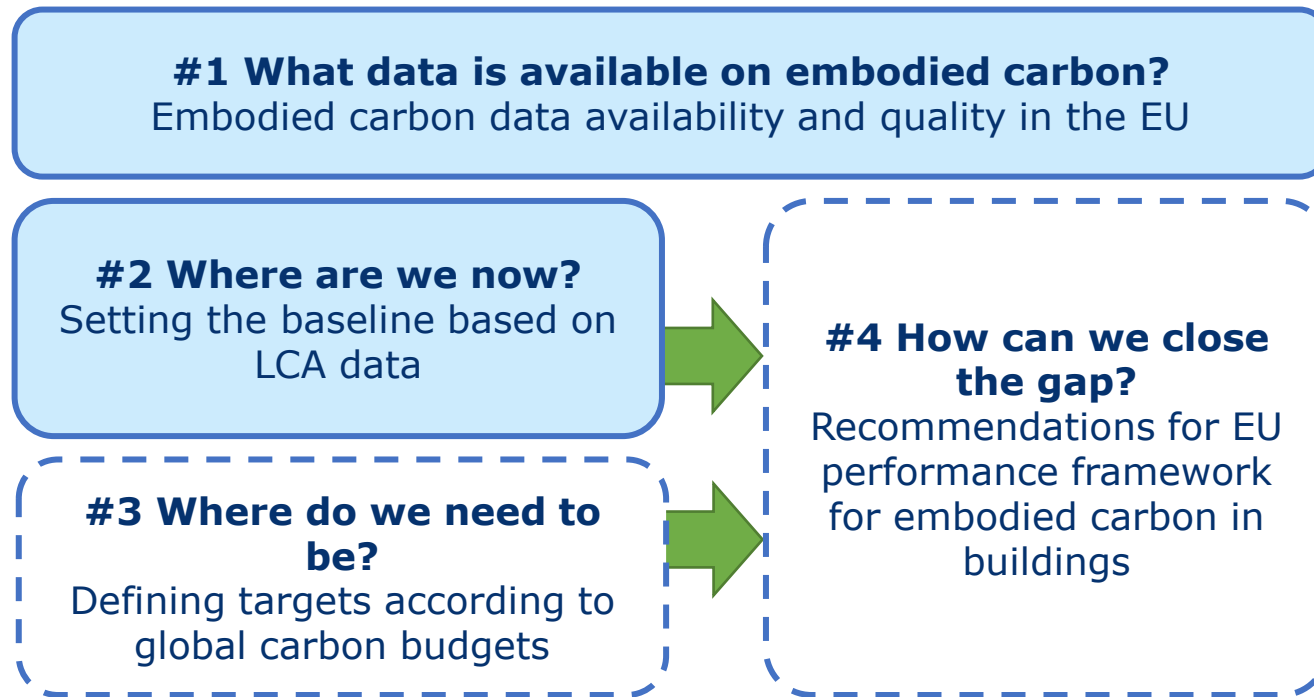
All stakeholders need to act with urgency to enable building sector decarbonization

Embodied carbon (kgCO$_2$e/m2)

Performance gap

— Cost-Efficient Pathway (CEP)
— Paris-Aligned Pathway (PAP)
○— Baseline
◇ Commitment limit values, possibly in legislation
● Voluntary Paris-aligned benchmarks
▮ Performance gap (budget overshoot)
▮ Carbon budget
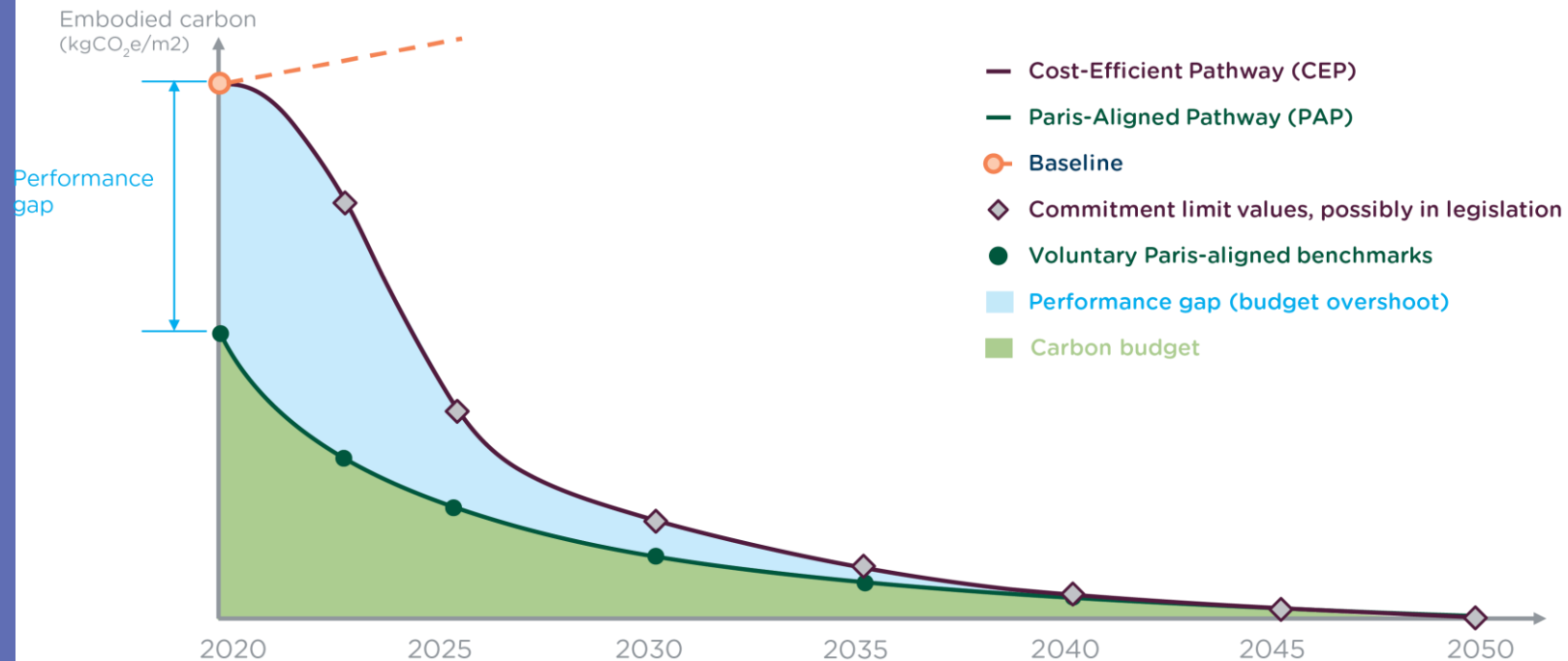
- Any **delay increases the budget overshoot**

- **Data collection and emission reduction** need to be stepped up
  - **Governments** to define standard methods with strong incentives
  - **Certification** bodies to share LCA data and promote budget-aligned benchmarks
  - **Investors** to align portfolios with reference values and move to climate neutrality in buildings
  - **Designers** to design buildings within reference values

A performance framework can bridge the gap between baseline and carbon budget

RAMBØLL

KU LEUVEN

Data foundation

1	**2**	**3**
LCA method and metrics	Data generation	Data collection

Performance definition

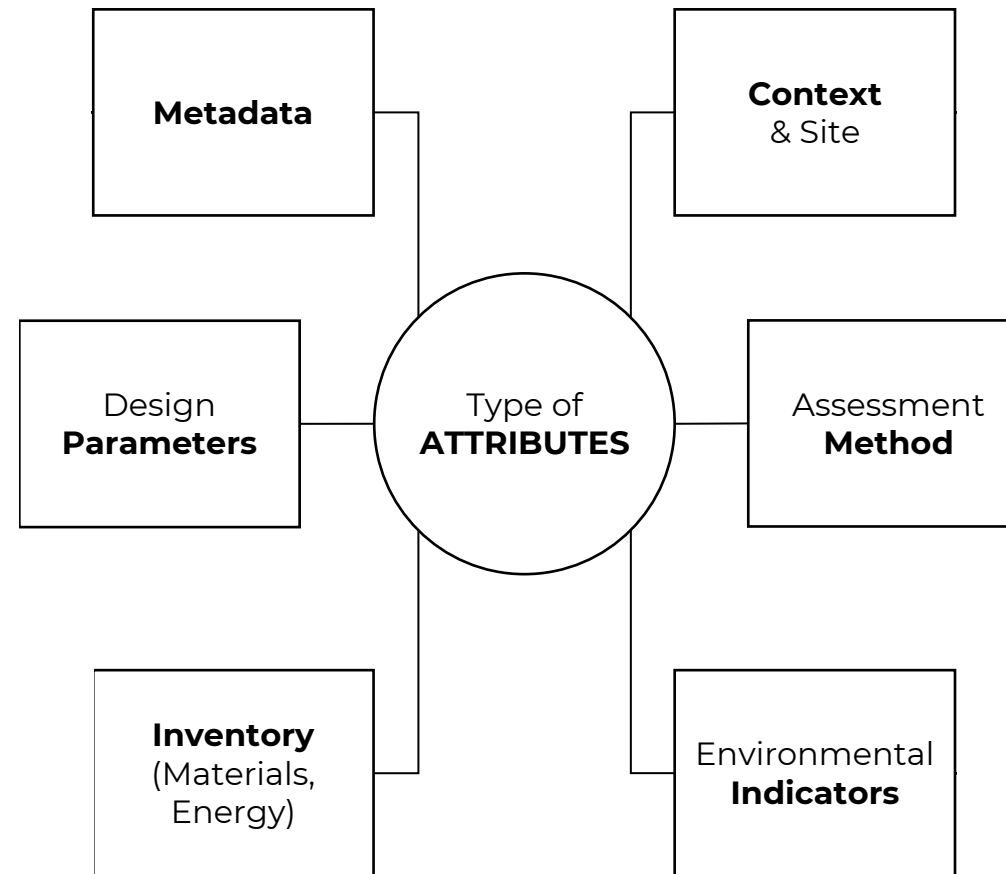|		
4	**5**	**6**
Baseline	Carbon budget	Benchmarks and limit values along pathways
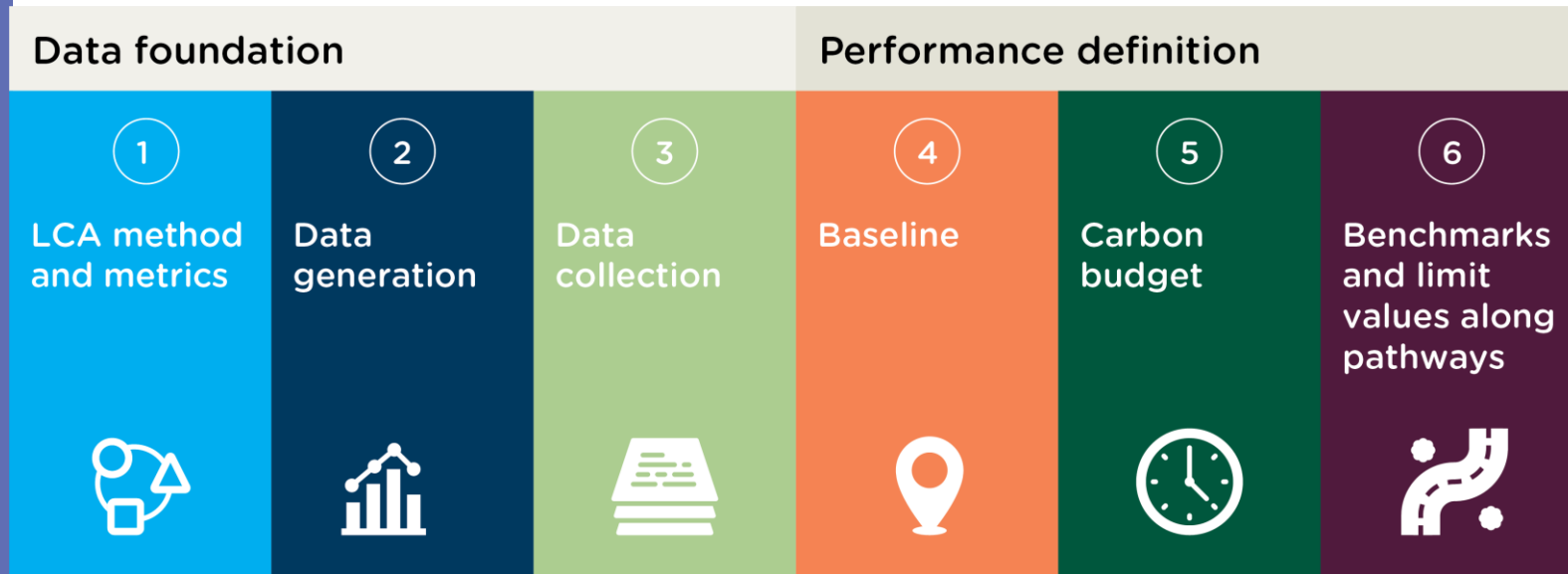
Recommendations

- **Collaborative effort needed** to create the evidence base through LCA/WLC building data collection and benchmarking

- Combining both **bottom-up and top-down** considerations on embodied carbon measures

- Defining **Paris-aligned pathway** for climate neutrality and a **cost-efficient pathway** as a reduction commitment by the industry
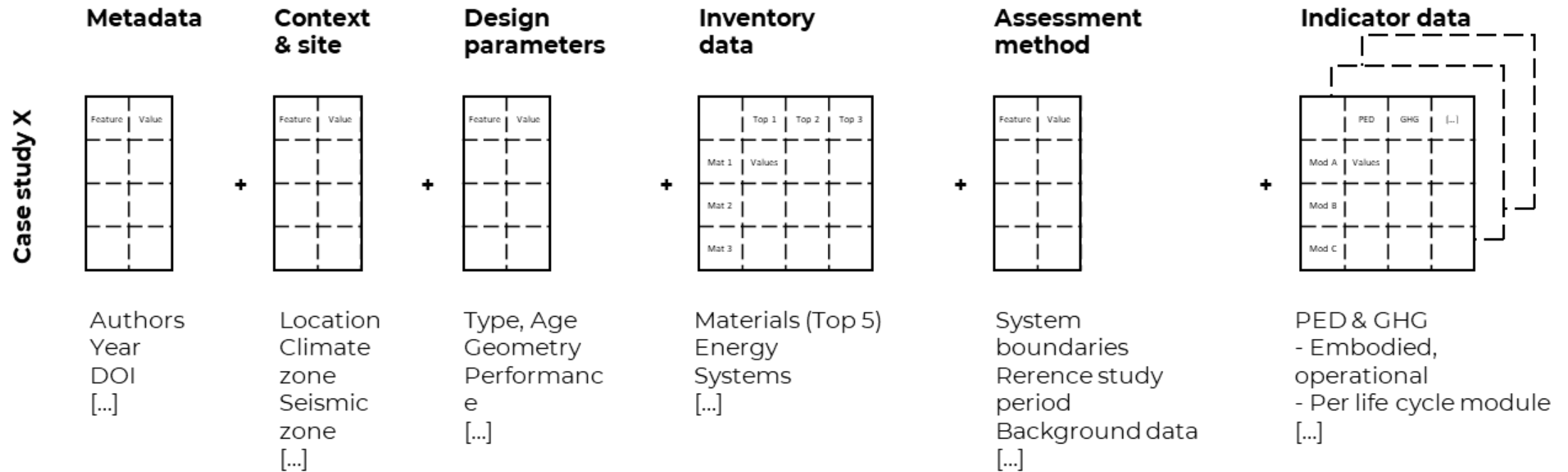
Data processing and analysis

Data collection - Attributes

Metadata

Context & Site

Design **Parameters**

Type of **ATTRIBUTES**

Assessment **Method**

Inventory (Materials, Energy)

Environmental **Indicators**

Showing selected attributes from data collection template of Röck et al. 2023 (forthcoming)

Data collection - Structure

Case study X

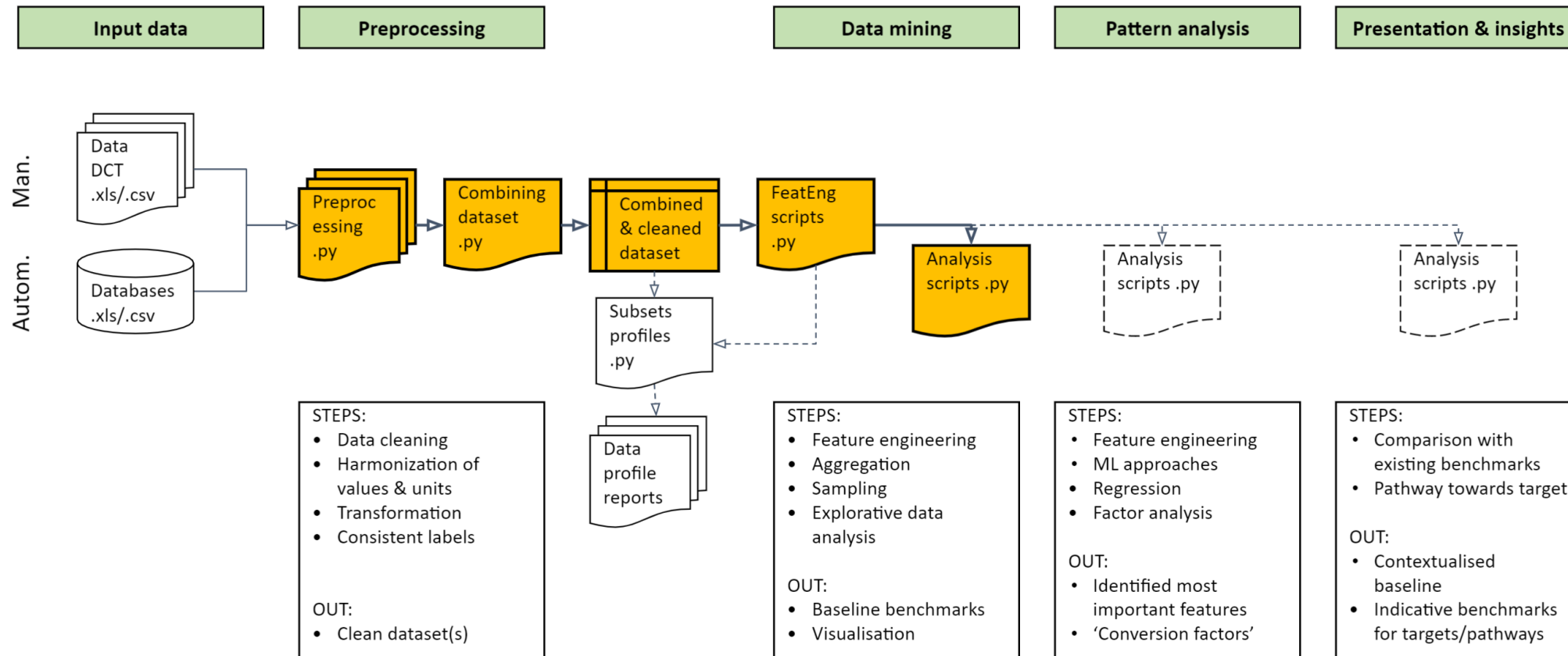| Metadata	Context & site	Design parameters	Inventory data	Assessment method	Indicator data
Authors Year DOI [...]	Location Climate zone Seismic zone [...]	Type, Age Geometry Performance [...]	Materials (Top 5) Energy Systems [...]	System boundaries Rerence study period Background data [...]	PED & GHG - Embodied, operational - Per life cycle module [...]

Data collection - Template

- Spreadsheet-based data collection template (DCT)
  - Free input (numbers, text)
  - Preset options (categories, ranges)

DATA COLLECTION TEMPLATE

Note: Put 'n/a', if no value can be provided. Avoid empty cells. * = Minimum Requirement

GROUP	ADMINISTRATION		BUILDING DESCRIPTION									
Attribute Name	Project Name / Code	Project Contact	Building type	Building sub typology	Project type	Country of Construction	Year of construction permit	Year of construction completion	Year of construction completion interval	Project data status	Gross Area Definition	
Unit remarks	Please specify	Please specify	Use drop-down	Use drop-down	Use drop-down	Use drop-down	Number [integer]	Number [integer]	Use drop-down	Use drop-down	Use drop-down	
1	Fictive Example Case	EU-ECB	Residential	Multi-family house	New Built	Denmark	2017	2019	2015-2019	Detailed design	Denmark (BR18)	
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												

Data processing and analysis

Data harmonization

- Floor area definition
  - Gross floor area (GFA)
- Reference study period
  - RSP_h = 50 years
- Differentiated handling
  - Product & EoL: A1-5, C1-4 (1)
  - Use-phase: B1-4, B6-7 (2)
  - Annualization (3)

- No perfect harmonization, but useful approximation

Formulae

$$(1)\ GHG_{t,\,h} = GHG_{a,o} * RSP_o$$
$$(2)\ GHG_{t,\,h} = GHG_{a,o} * RSP_h$$
$$(3)\ GHG_{a,\,h} = GHG_{t,h} / RSP_h$$

Where:
- GHG = GHG emission values
- RSP = Reference study period
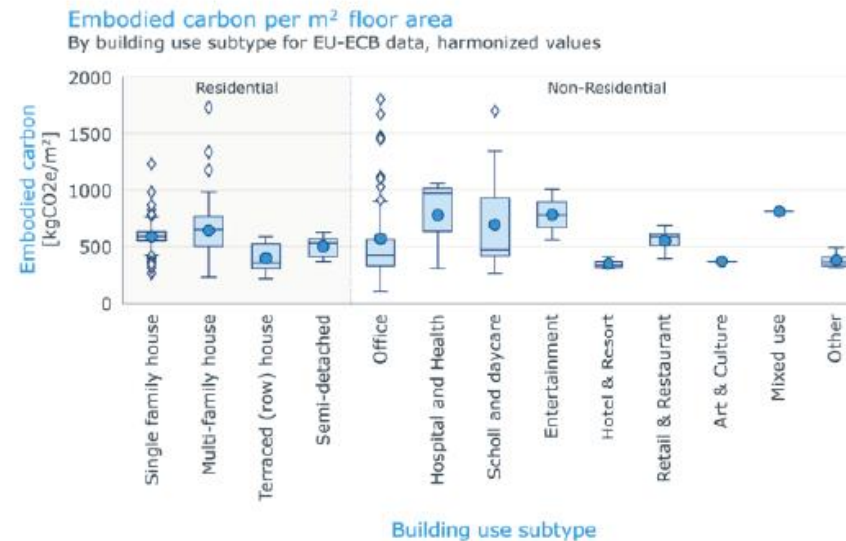- a = annualized
- h = harmonized
- o = original
- t = total

Challenges to benchmarking

Cross-Europe benchmarking hindered by lack of consistency of study scope, assessment methods, and documentation quality

Embodied carbon per m² (harmonized) by building use type (EU-ECB)
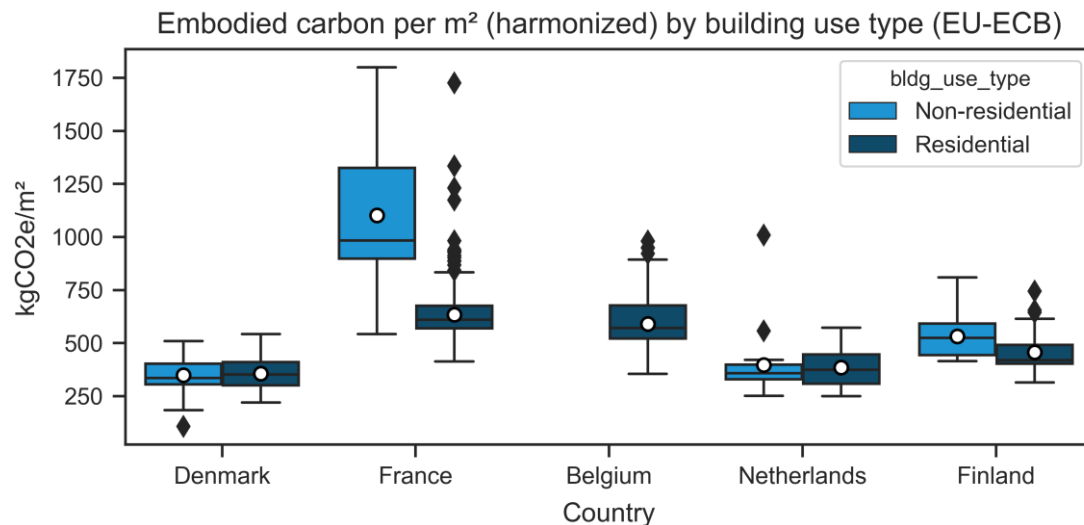
Parts \ LCS	Non-residential		Residential	
	Full life cycle scope (PCMDW)	**Limited life cycle scope** (PMW)	**Full life cycle scope** (PCMDW)	**Limited life cycle scope** (PMW)
Full parts scope (GLEISA)	819.80	264.69	618.19	-
w/o Ground (LEISA)	810.00	-	481.63	-
w/o Internal (GLESA)	-	-	599.19	-
w/o Appliances (GLEIS)	523.18	349.19	575.49	356.67
w/o Internal & Appliances (GLES)	-	404.50	-	-
w/o Services & Appliances (GLEI)	-	-	-	343.00

Röck M, et al. "Towards Embodied Carbon Benchmarks for Buildings in Europe - #2 Setting the Baseline: A Bottom-up Approach.", 2022. https://doi.org/10.5281/zenodo.5895051.

73

Dataset and scripts available

Embodied carbon per m² floor area
By building use subtype for EU-ECB data, harmonized values

Röck and Sorensen, Embodied Carbon of European Buildings Database (EU-ECB-DB), 2022, https://doi.org/10.5281/zenodo.6671558

Data infrastructure and analytics

EU Level(s) framework

- Common EU sustainability reporting framework with wide applications

- Reporting standard for material QTO, Whole Life Carbon, and LCA results

- Options for adapting scope and assessment methods (Level 1/2/3)

- Results reported by building part (-1/-2) and by life cycle stage (EN 15978)

https://lifelevels.eu/

Data collection - Template

- Spreadsheet-based data collection template (DCT)
  - Free input (numbers, text)
  - Preset options (categories, ranges)

DATA COLLECTION TEMPLATE
*Note: Put 'n/a', if no value can be provided. Avoid empty cells. * = Minimum Requirement*

			*	*	*	*	*	*			*	*	
GROUP	**ADMINISTRATION**		**BUILDING DESCRIPTION**										
Attribute Name	**Project Name / Code**	**Project Contact**	**Building type**	**Building sub typology**	**Project type**	**Country of Construction**	**Year of construction permit**	**Year of construction completion**	**Year of construction completion interval**	**Project data status**	**Gross Area Definition**	
Unit remarks	Please specify	Please specify	Use drop-down	Use drop-down	Use drop-down	Use drop-down	Number [integer]	Number [integer]	Use drop-down	Use drop-down	Use drop-down	[
1	Fictive Example Case	EU-ECB	Residential	Multi-family house	New Built	Denmark	2017	2019	2015-2019	Detailed design	Denmark (BR18)	
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												

EU Level(s) framework

Building parts			Life cycle stages														
Level -1 (Elements)	Level -2 (Sub-elements)	Level -3 (Materials)	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	(D)
Foundations (substructure)	Piles	[...]															
	Basements	–															
	Retaining walls	–															
Load bearing structural frame	Frame (beams, columns and slabs)	–															
	Upper floors	–															
	External walls	–															
	Balconies	–															
Non-load bearing elements	Ground floor slab	–															
	Internal walls, partitions and doors	–															
	Stairs and ramps	–															
Facades	External wall systems, cladding and shading devices	–															
	Façade openings (including windows and external doors)	–															
	External render	–															
Roof	Structure	–															
	Weatherproofing	–															
Parking facilities	Above ground and underground	–															
Fittings and furnishings	Sanitary fittings	–															
	Cupboards, wardrobes and worktops	–															
	Ceilings finish	–															
	Wall finish	–															
	Floor coverings and finishes	–															
Drainage systems	Drainage system	–															
Utilities	Connections and diversions	–															
	Substations and equipment	–															
Landscaping	Paving and other hard surfacing	–															
	Fencing, railings and walls	–															
In-built lighting system	Light fittings	–															
	Control systems and sensors	–															
Energy system	Heating plant and distribution	–															
	Cooling plant and distribution	–															
	Electricity generation and distribution	–															
Ventilation system	Air handling units	–															
	Ductwork and distribution	–															
Sanitary systems	Cold water distribution	–															
	Hot water distribution	–															
	Water treatment systems	–															
	Drainage system	–															
Other systems	Lifts and escalators	–															
	Firefighting installations	–															
	Communication and security installations	–															
	Telecoms and data installations	–															

EU Level(s) requirements to align with

Adapt method to national needs

Reporting and benchmarking infrastructure
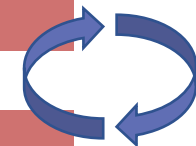
Hotspot analysis protocol

- Screening and analysis of environmental hotspots
  - Product/organizational environmental footprints (PEF/OEF)

Relevant for informing building and construction professionals

Most relevant impacts / indicators	Most relevant life cycle stages	Most relevant processes	Most relevant elementary flows

Relevant to identify and avoid environmental trade-offs

Relevant for informing policy makers, data and documentation requirements
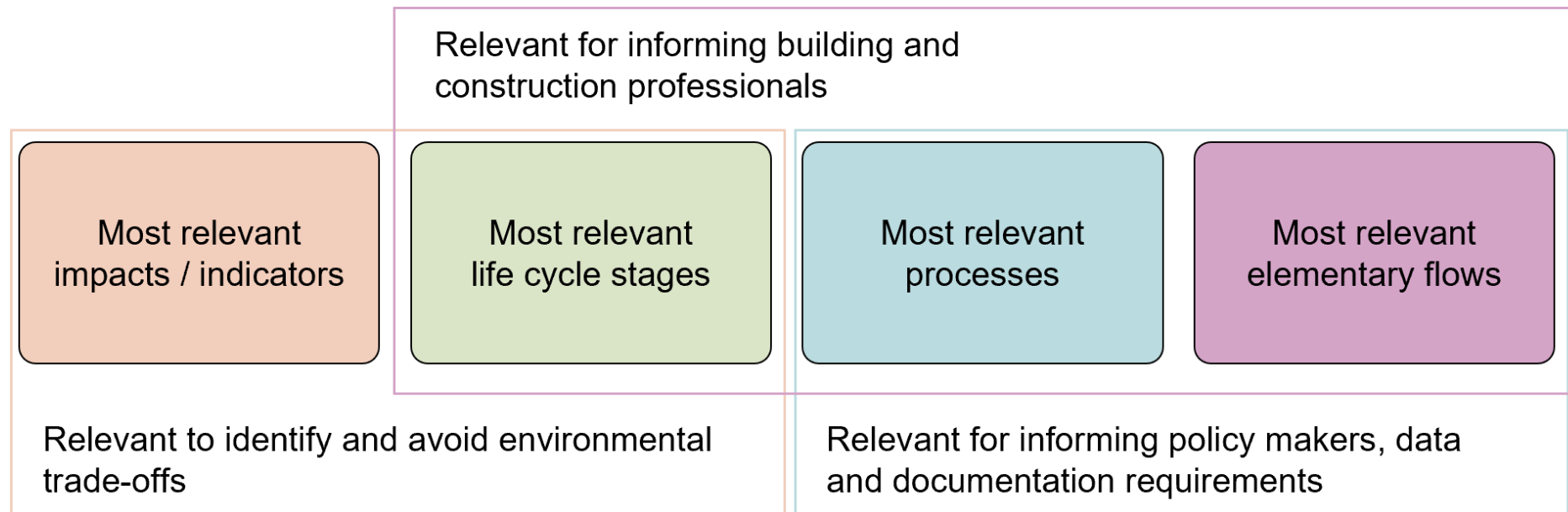
SLiCE building data model

SLiCE hotspot analysis tool

What next?

Recommendations

- Collect/generate data for representative samples
  - Start by characteristics of building stock & new construction activity

- Extend scope of analysis and documentation requirements
  - Extend attributes, e.g., with structural design parameters
  - Align documentation template with Level(s) elements and materials

- Advance processing workflows and analytics
  - Interactive WLC dashboard for visual exploration
  - SLiCE data logic and hotspot analysis tool

- Support public & private stakeholders to advance WLC data

Q&A

Cocreation session
Representative buildings sample and WLC data attributes

Outline

Representative sample and data attributes [40min]

- Approach for setting representative buildings sample [15 min]
- Defining relevant WLC attributes before collection [25 min]

What is our representative buildings sample?

- Which are the primary stakeholders addressed by the WLC data initiative towards benchmarking?

- Should the building cases be representative of all new construction, or a fraction relevant to stakeholders?

- What are relevant partners, data sources, e.g., to consult on statistical composition of building stock activities?

Discussion notes

- Use statistical data on most common materials, buildings
  - Residential have highest volume (materials, surface, budget)
  - Different typologies, SFH
- Regional differences
  - Construction culture, climate/energy, materials
- Local councils have typology definitions
  - Statistical profile of new construction shared to ministry
  - Data quality validation required
- Cost-effectiveness study EPBD; Tabula/Episcope?
- Data sources for non-residential buildings?

What is our representative buildings sample?

- Which building characteristics are representative?
  - Building typology (SFH, MFH, offices, …)
  - Geometry and size (Floor area (interval), window-to-wall, …)
  - Structure and materials (Structural requirements, spans, …)
    - Seismic requirements,
  - Energy performance (Heating energy use, U-values, …)
    - Climate zones…

- Which information is needed to make sense of results?
  - LCA database, LCIA method, scenarios, service lives, etc.

Archetype modelling

- Representation = Archetypes
  - Real world cases
  - Synthetic cases
- Pros and cons of both
  - Real: More 'realistic'
  - Synthetic: More 'adaptable'

- Synthetic archetypes
  - E.g., Belgium (EPBD cost-effective)
- Benefits of synthetic
  - Control constants/variables (e.g.)
    - Constant: Geometry, materials
    - Variable: Energy performance, systems, seismic requirements

Discussion notes

- Combination of synthetic and real cases
  - 50 synthetic, tuned to represent the regional differences
  - 10+ real cases collected from industry partners
  - Use data collection and analysis to assess method differences
  - Elaborate data collection and attributes bilaterally
- Question about number of climate regions
  - 5 climate regions required or inefficient?
  - Focus resources, e.g., on testing more typologies, materials?
- Archetypes available from national renovation strategy
  - Residential only, could inform INDICATE typology/geometry
  - Potential synergies for future WLC benchmarks of renovation

Which attributes to analyse?

1. **Brainstorm individually** [10 min]
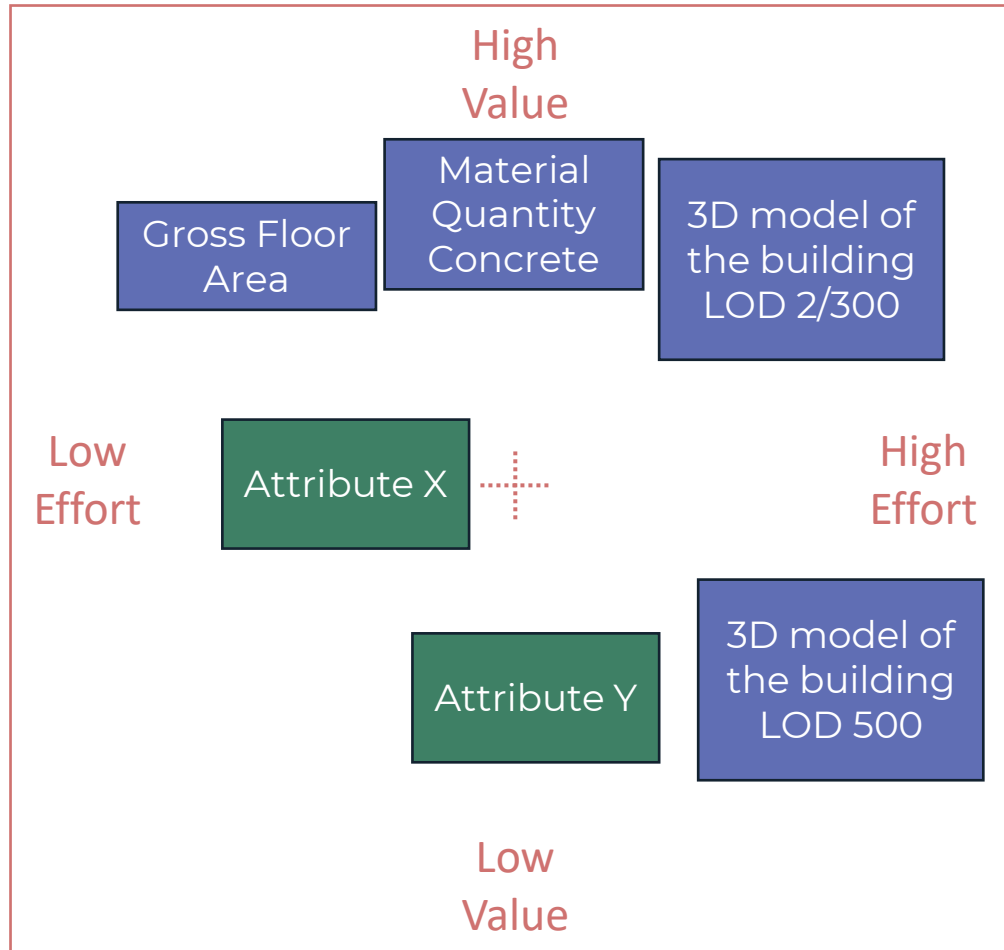   - Write all attributes that come to mind - 1 sheet per attribute

Infobox

- Try to be specific with attributes
  - Gross Floor Area
  - Material Quantity Concrete
  - …
  - 3D Model LOD 300

Which attributes to analyse?

1. Brainstorm individually [10 min]
   - Write all attributes that come to mind - 1 sheet per attribute

2. **Systematically evaluate** [10 min]
   - Set up value/effort matrix (on table, on board)
   - Place cards and move until equilibrium – in silence!

Value / Effort Matrix

High
Value

Gross Floor Area

Material Quantity Concrete

3D model of the building LOD 2/300

Low
Effort

Attribute X

High
Effort

Attribute Y

3D model of the building LOD 500

Low
Value

Infobox

- Cards can move back and forth, if needed
  - Don't fight, seek common ground
- Multiple mentions of same attribute are OK
  - Can be combined or separate

Which attributes to analyse?

1. Brainstorm individually [10 min]
    - Write all attributes that come to mind - 1 sheet per attribute

2. Systematically evaluate [10 min]
    - Set up value/effort matrix (on table, on board)
    - Place cards and move until equilibrium – in silence!

3. **Discuss outcomes and implications** [10 min]
    - What un/expected outcomes do we see?
    - How can we obtain the relevant data?

Photo!

Value / Effort Matrix
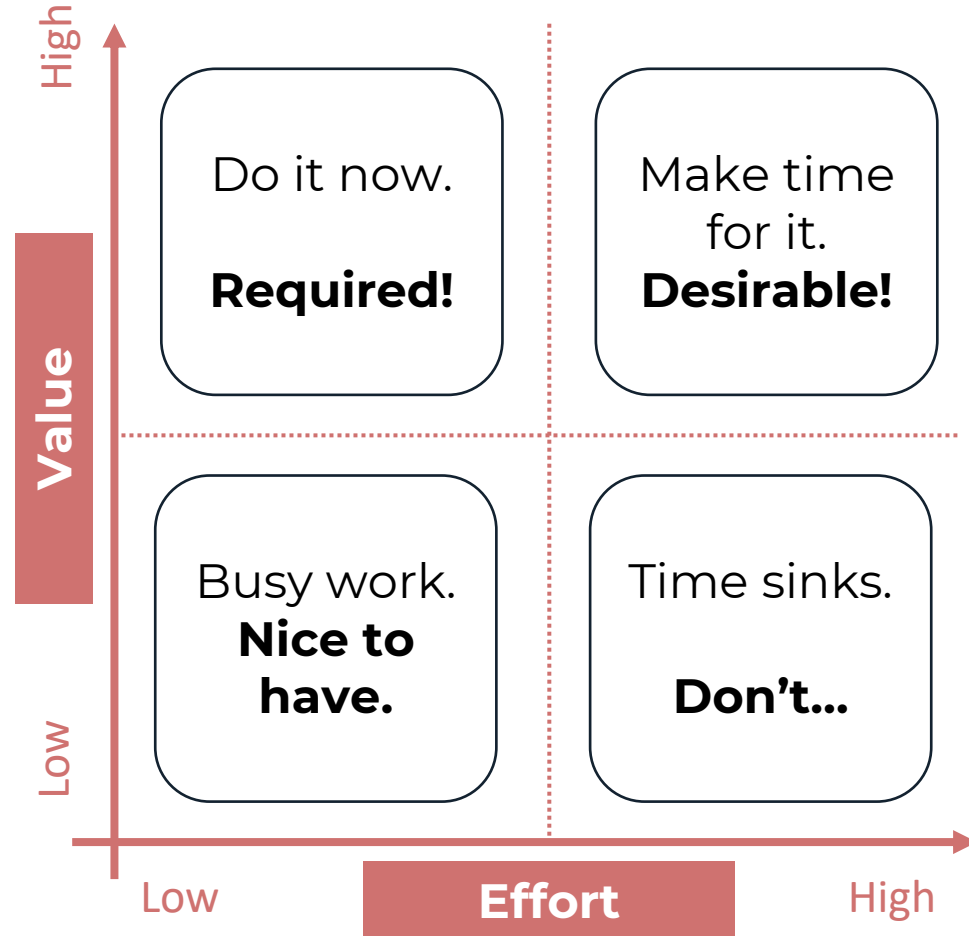
Value / Effort Matrix
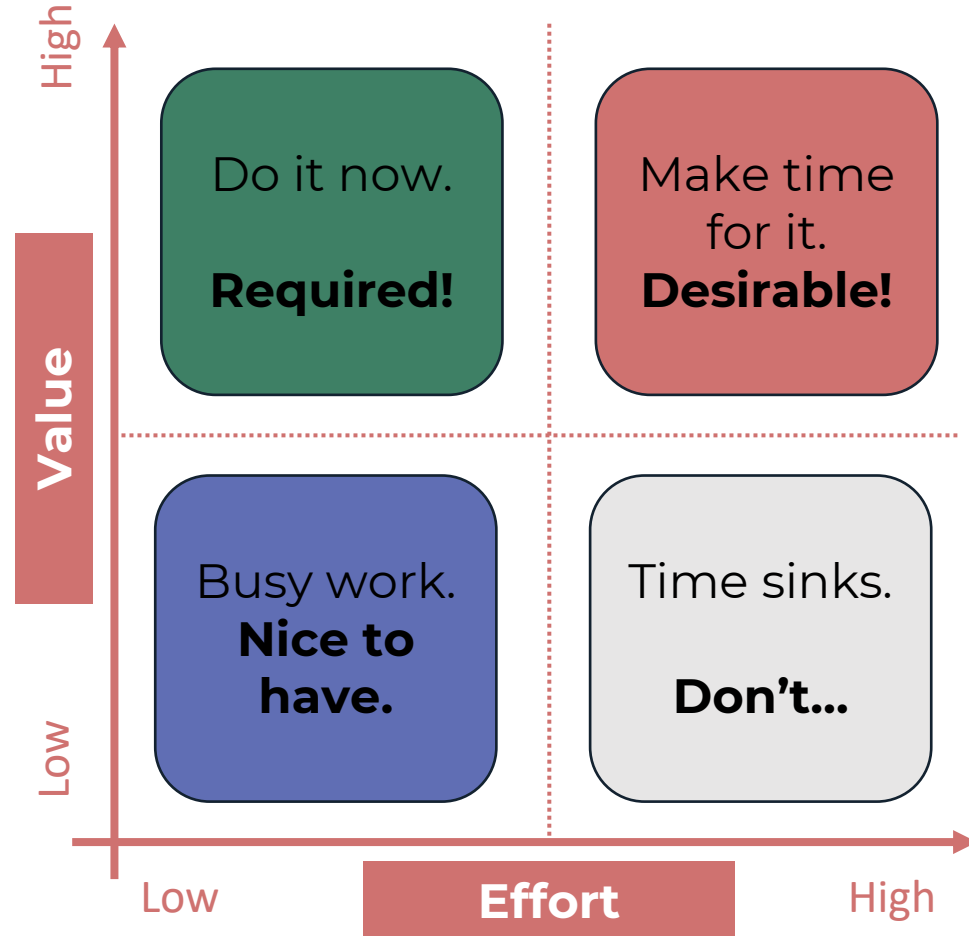
Next steps

- Implement attributes to data collection template (DCT)
- Continue definition of representative sample and cases
- Advance on WLC data collection or modelling
- Proceed with processing, analysis and benchmarking
- ...

Agenda input

- Frontrunners
- Building Blocks for WLC regulation
- Starting point
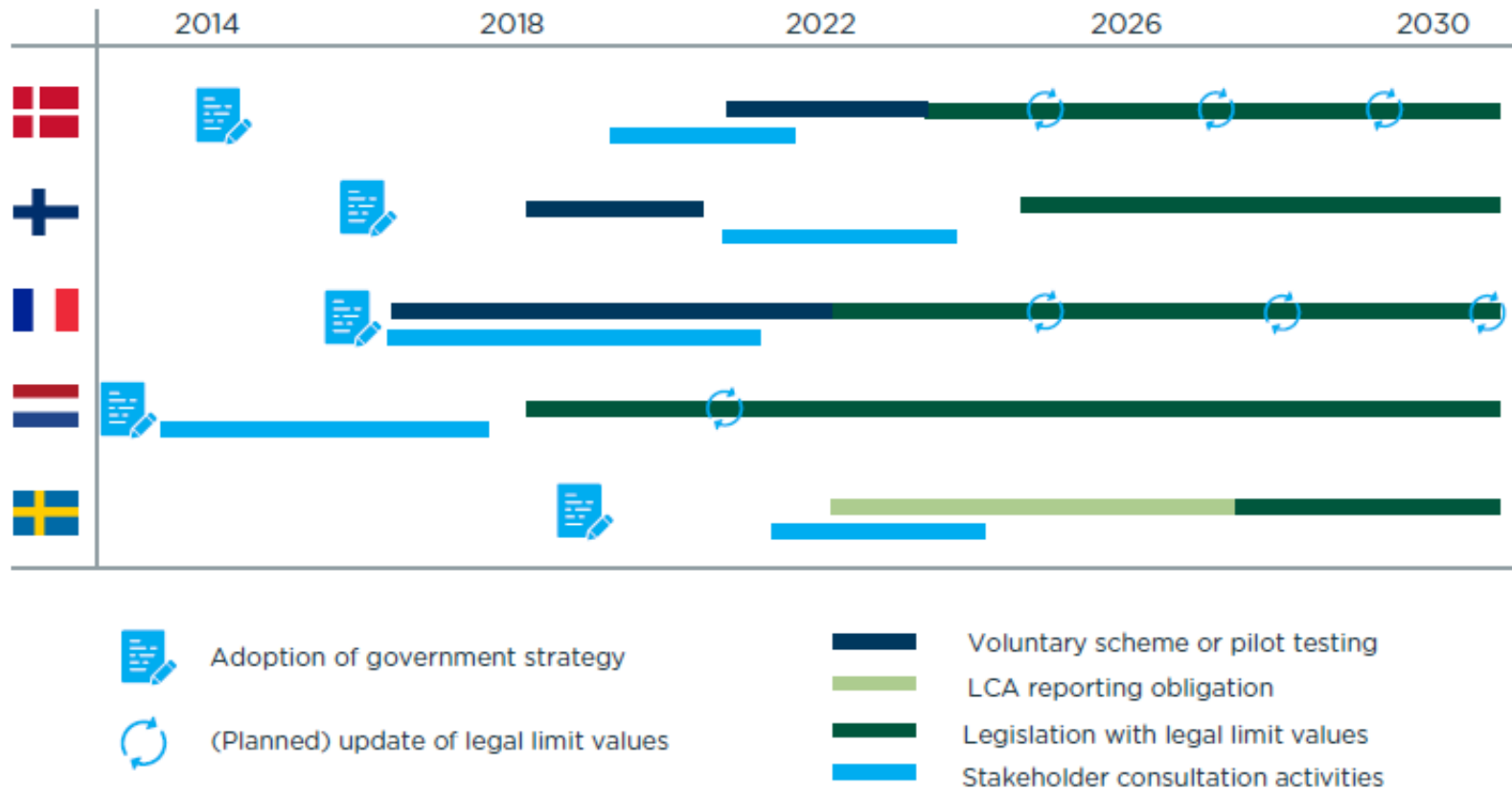- Challenges and opportunities

EU Update

- Not if, but how to regulate WLC

- Comprehensive EU WLC reporting requirements coming soon

- Data is not yet accurate, but we need action more than precision

- Start measuring, share data and build capacity on WLC data collection and baseline analysis for ensuring future target compliance

- Frontrunner countries have the support of the EU
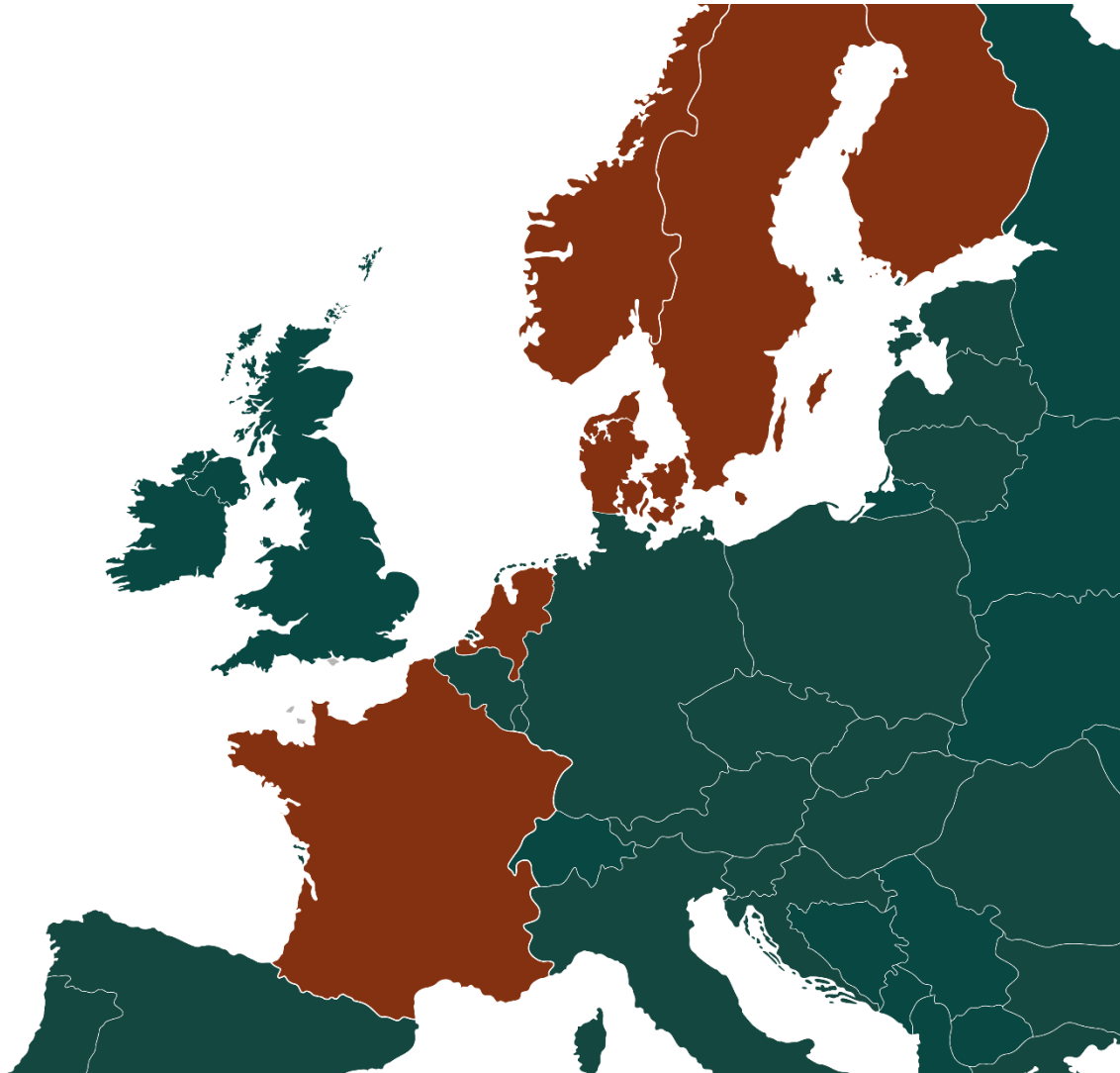
Leading EU Member States

- 2012 Netherlands (Documentation 2012; limit value 2018)

- France (2021)

- Sweden (2022 Documentation)

- Norway (2022 Dokumentation)

- Denmark (2022)

- Finland (2023)

- *Germany, UK, Switzerland (WLC requierements for public buildings)*

Frontrunner countries: „key ingredients"

Key ingredients:

- Government strategy
- Stakeholder enagement
- Voluntary scheme / pilot testing
- Gradual implementation of legislation

Source: Rambol / KU Leuven 2023

Example DK: process (I)

INDICATE

Voluntary sustain-ability class

2014

Government Climate Strategy > Sectoral Climate Partnerships

Recommendations by the partnership for implementing limit value

Reference value analysis from BUILD research institute (60 buildings are analyzed)

Broad political agreement of the national strategy for sustainable construction, with limits for CO2-eq..

2019

2020

2021

2022

Method for LCA calculation is elaborated

Klimapartnerskab for bygge og anlæg

BUILD REPORT 2021:12
WHOLE LIFE CARBON ASSESSMENT OF 60 BUILDINGS
POSSIBILITIES TO DEVELOP BENCHMARK VALUES FOR LCA OF BUILDINGS

National Strategy Sustainable Con...

Aftale mellem regeringen (Socialdemokratiet) og Venstre, Dansk Folkeparti, Socialistisk Folkeparti, Radikale Venstre, Enhedslisten, Det Konservative Folkeparti og Alternativet om:

National strategi for bæredygtigt byggeri

5. marts 2021

Example DK: process (II)

INDICATE

National hearing (5 weeks)
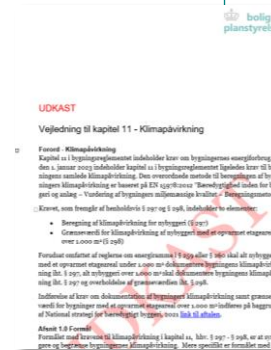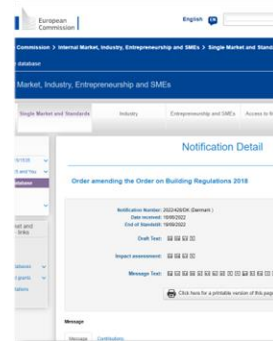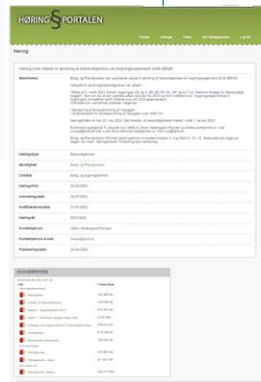
EU Notification (3 month)

Guidance on regulation is being developed in collaboration with industry

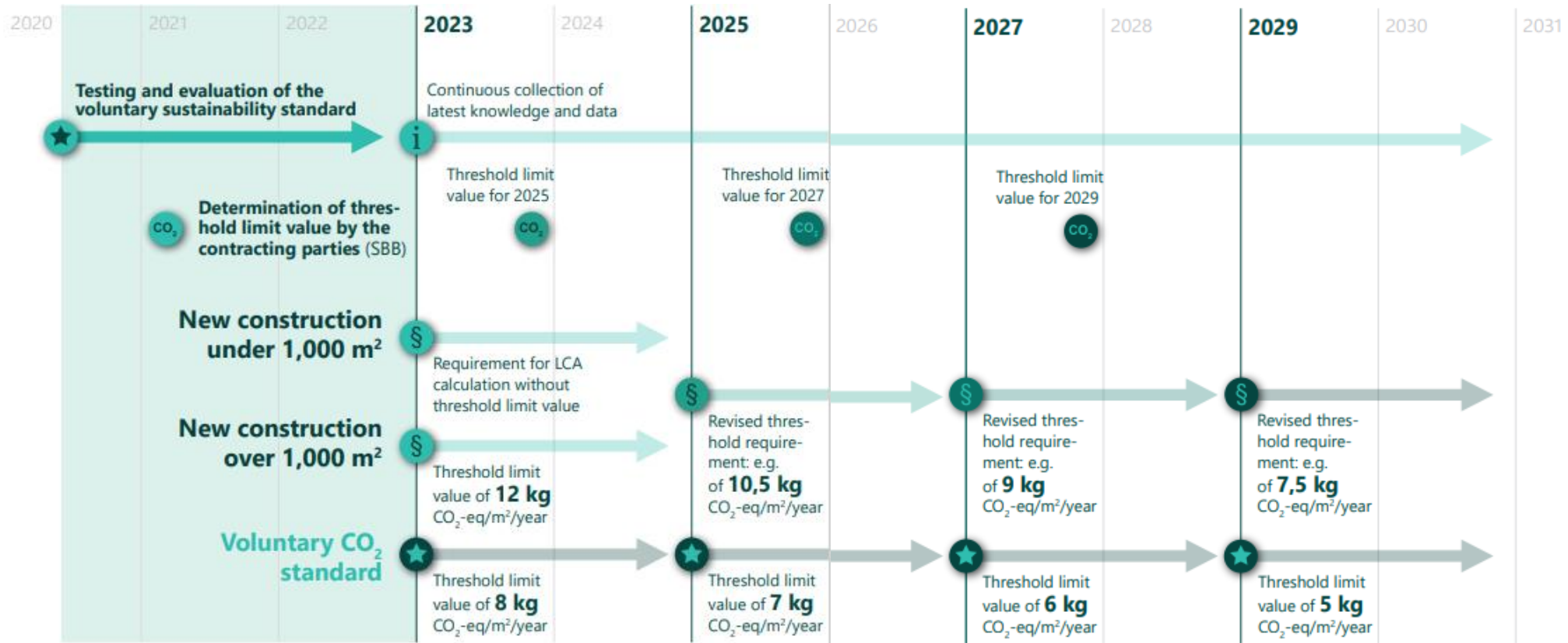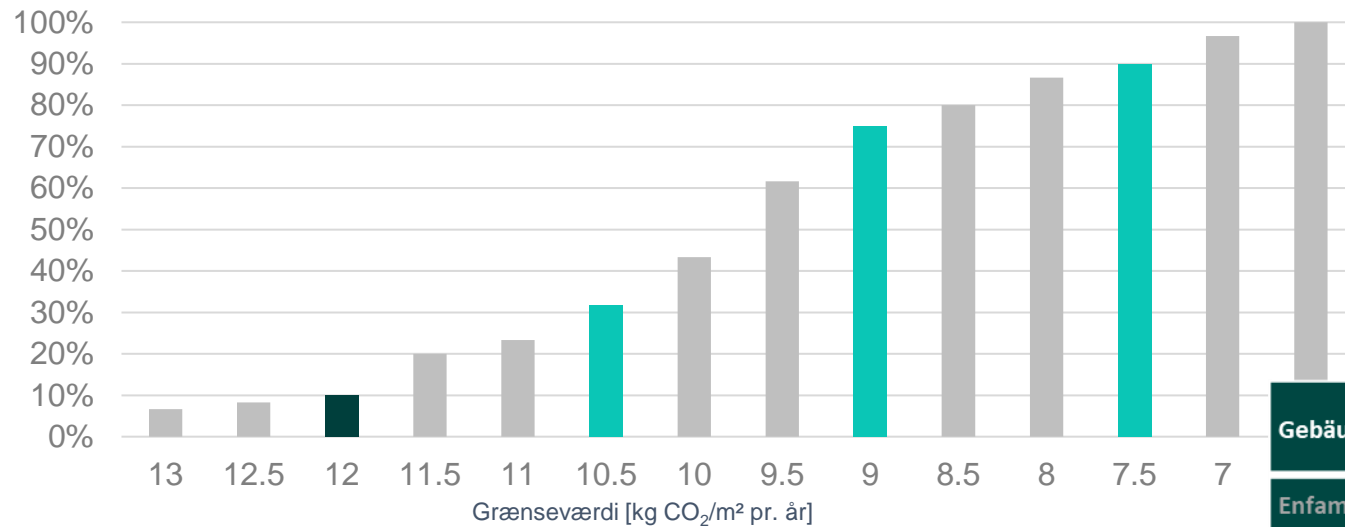**Limit values for CO2-eq. are part of the Danish Building Regulation**

2022

Definition of the regulation is developed

2023

Example DK: Outlook

Example DK: gradual implementation

How many buildings need to comply with the limit value?

Share of buildings below the limit value (from reference analysis of 60 buildings)

Gebäude pro. Jahr	Unter 1000 m²	Über 1000 m²	Insgesamt
Enfamiliehuse	4.109	0	4.109
Rækkehuse	529	2	531
Etageboliger	264	210	474
Produktionsbygninger	939	176	1.125
Kontor og handel	507	156	662
Kultur, sundhed, idræt, undervisning	167	44	210
Gesamt (Anzahl)	6.515	597	7.112
Gesamt (m²/Jahr)	1.676.781	1.944.102	3.621.205

Example DK: other success factors / good practice

- Nordic Co-operation

- Knowledge Centre on the Climate Impacts of Buildings

The Netherlands: Process

Time Line

The road to buildings decarbonization in The Netherlands

2006 — Environmental Building Regulation

2011 — Determination Method R 1.0

2014 — Determination Method R 2.0

2018 — Obligatory EPB 1,0 €/m²/yr

2020 — Start NMD as foundation

2021–2025 — Performance requirement more stringent step by step to be halved **to 0,5 ultimately in 2025**
- EPB 0,8 €/m2/yr for housing, from July 1st 2021
- Update to EN 15804+A2, with 19 indicators in NMD
- WKB (Quality Guarantee Law)

European 2030 Greenhouse gas emissions reduction target:
- At least 40% cuts in greenhouse gas emissions (from 1990 levels)
- At least 32% share for renewable energy
- At least 32.5% improvement in energy efficiency

2030 · **2050**

Year	Event
2011	EN15978 Assessment of buildings (EPB in Dutch MPG)
2012	Publication of EN 15804:2012+A1:2013
2013	Proscribed Assessment method
2019	EU publication of EN 15804+A2
2020	Determination method adapted to EN15804:2019 with transition period
2022	Update to EN 15804+A2, new indicators in NMD
2022	from July 1st, WKB (Quality Guarantee Law)
2030	Performance requirement more stringent step by step to be halved ultimately to 0,5
2030	European Greenhouse gas emissions reduction target
2050	Netherlands a Circular Build Environment

Circular NL in 2050

The Netherlands: policy landscape

NMD Organization and Committees

Public-Private process
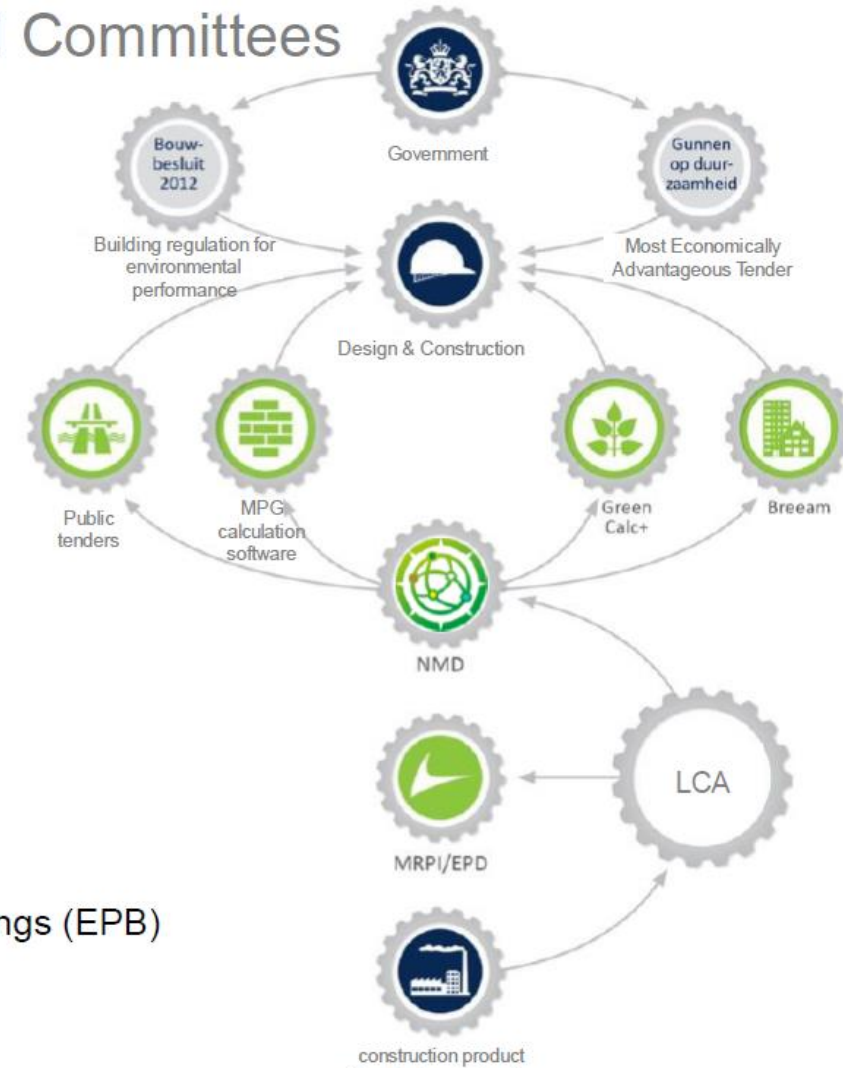
Building regulation

Product database

Prescribed assessment method

Environmental Performance of Buildings (EPB)

The Netherlands: practice

- Consultation ongoing to sharpen the Energy Performance of Buildings value to 0,5 in 2025 – outcome expected in June

- Monetary value (€/m2/year) widely used in public procurement

FINLAND - Timeline

INDICATE

2017
- CO2 limit values for buildings in low carbon construction roadmap*

2019
- Agreement climate neutrality 2035
- Nordic agreement harmonization LCA approach for buildings

2021-2022
- Legislative preparations**
- Draft Legislative proposal
- Public hearings (1 & 2)

2023
- Land use and Construction Act reform approved – WLC regulation to follow

01-2025
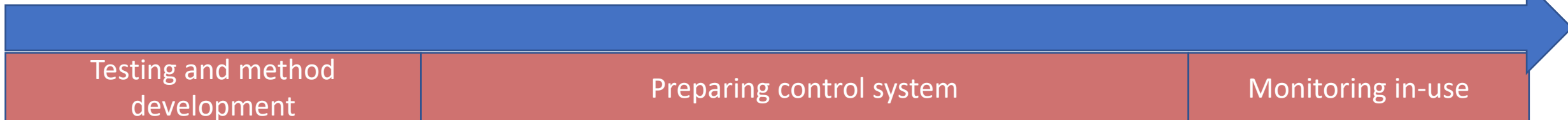
Testing and method development	Preparing control system	Monitoring in-use

Testing and method development
- Control system impact assessments
- Development of the carbon footprint calculation model and emissions database
- Know-how and tools
- Testing in public construction projects and in the private sector

Preparing control system
- Preparation of regulatory guidance and possible incentives
- Connection to planning and energy management
- Expansion of pilot projects
- Preparation of building emission data monitoring and statistics

Monitoring in-use
- Possible notification obligation before binding limit values
- The building base can be connected to the control in stages
- Monitoring the emission data of the building stock

FINLAND – Policy landscape

- Calculation tool (.xls)

- Emission database (together with Sweden)

- Collaboration with 100+ industry experts
- Based on existing public information from various sources (RTS EPD, EPD Norge, IBU)*
- Comparison, selection and calculation of averages
- No product specific data
- Three waves of testing – supported with subsidies / beta testing Level(s)

FINLAND

- Assessment method based on Level(s) and EN standards

- Software tools: free tool + market approach (e.g. OCLCA)

- Lessons for method and database development
  - Align with building design practice – user friendly, which stage of the design process is this relevant (permit/delivery) and what precision of data is necessary?
  - Link to digitalization and BIM to avoid redundant work
  - Importance of verification – different consultants and tools should be tested
  - Assessment of different databases – what is required? How to structure the data?
  - Challenge: get small projects online without increasing administrative burden

FINLAND

- Importance international collaboration
  - Nordic Co-Operation
  - Relief to consult government officials with similar struggles
- Stakeholder engagement
  - Empathic approach – understanding concerns is essential
  - Inform in advance – now there is time to adjust
  - Offer subsidies to tackle problems
  - Limit values as enforcement method for laggers

Sweden

INDICATE
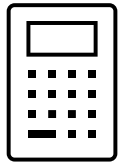
2015
- Analysis: what is the WLC-state of affairs among industry – is there a need for regulation?

2017
- Request to propose a calculation method for climate impact of construction products (A1-5)

2020
- Proposal for a roadmap and limit values
- Assignment to facilitate introduction of legislation

2022
- Launch Database
- Climate register
- Obligation of climate declarations
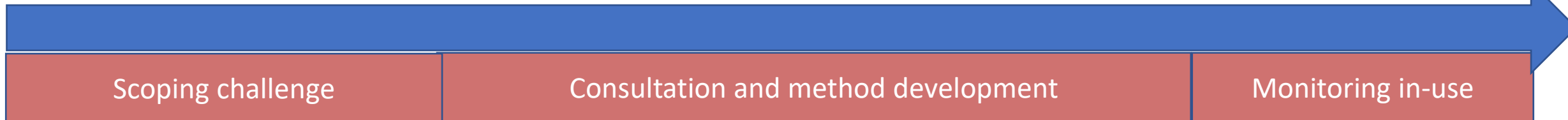
Scoping challenge	Consultation and method development	Monitoring in-use

2018
- Method to calculate environmental impact (A1-5)

- Assessment on integrating additional life cycle modules
- Updating calculation methods
- More data

Sweden

- Lessons for stakeholder engagement
  - Lawyer involved in drafting legislation – how to make it simple? What are the costs?
  - Cost-benefit studies to find balance between reliability and limited administrative burden
  - Public hearings
  - Focus groups with SMEs, software developers, municipalities, architects,
  - Capacity building and information sharing among SMEs – the ones without large internal capacity (handbook, webinars, big campaigns, introductory courses)
  - Focus on limited administrative burden
  - Sound scientific basis – essential to counter opposition (specific industry)
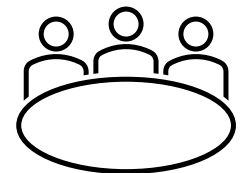
Sweden

- Assessment method based on EN standards and aligned with Level(s)

- Software tool & Database
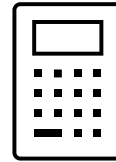
The construction sector's environmental calculation tool

START   ABOUT BM AND LICENSES   INSTALLATION   DIGITAL MANU...   Reports   Inst...   SU...

The construction sector's environmental calculation tool

The building sector's environmental calculation tool, BM, is an industry-wide tool for climate calculation of buildings.

The tool is based on life cycle analysis methodology according to EN 15804 and EN 15978 and enables a non-expert to produce a climate calculation of a building. With the tool, you can calculate how much climate impact different buildings have and how emissions can be reduced through changed material choices and production methods. The calculation can be used to comply with the Act on climate declaration for buildings, Miljöbyggnad's requirements for

Climate database from Boverket

Other languages   Listen

Boverkets climate database version 02.04.000 updated 24 january 2023.

Search the climate database

[Search field]   Search   My list

Categories >

Construction product

Blocks and tiles

Building boards

Concrete

Insulation

Mineral materials

Paints and sealants

Solid woods

Steel and other metals

Waterproofing

Windows, doors and glass

Energy services

Energy and fuel

Sweden

- Challenges
  - New government – is there still ambition in the ministry?
  - Short time frame – did not allow space for proper method development and stakeholder engagement
  - Lacking data for installations / environmental data (EPDs
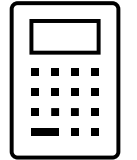
- Impact assessment and report on legislation being prepared since 2022
  - June : options to implement limit values starting in 2025
  - Including other life-cycle modules
  - August: public hearing
- Significant increase in EPDs since law implementation

Elements of the Toolbox

Process & Stakeholder engagement (inform, consult, co/create)

Data foundation

Performance definition

additional policy measures

Building blocks of the toolbox INDICATE

Stakeholder engagement

- Engaging research/academia
- Link to sustainability certification (LEED, BREEAM, DGNB)
- Industry collaboration workgroup
- Networks / Knowledge exchange

Data foundation

- Methods
- Data generation (calculation tools)
- Data collection & usage (databases, software tools)

Performance definition

- Baseline development
- Bench-marks
- Limit values

Typologies
Timeline
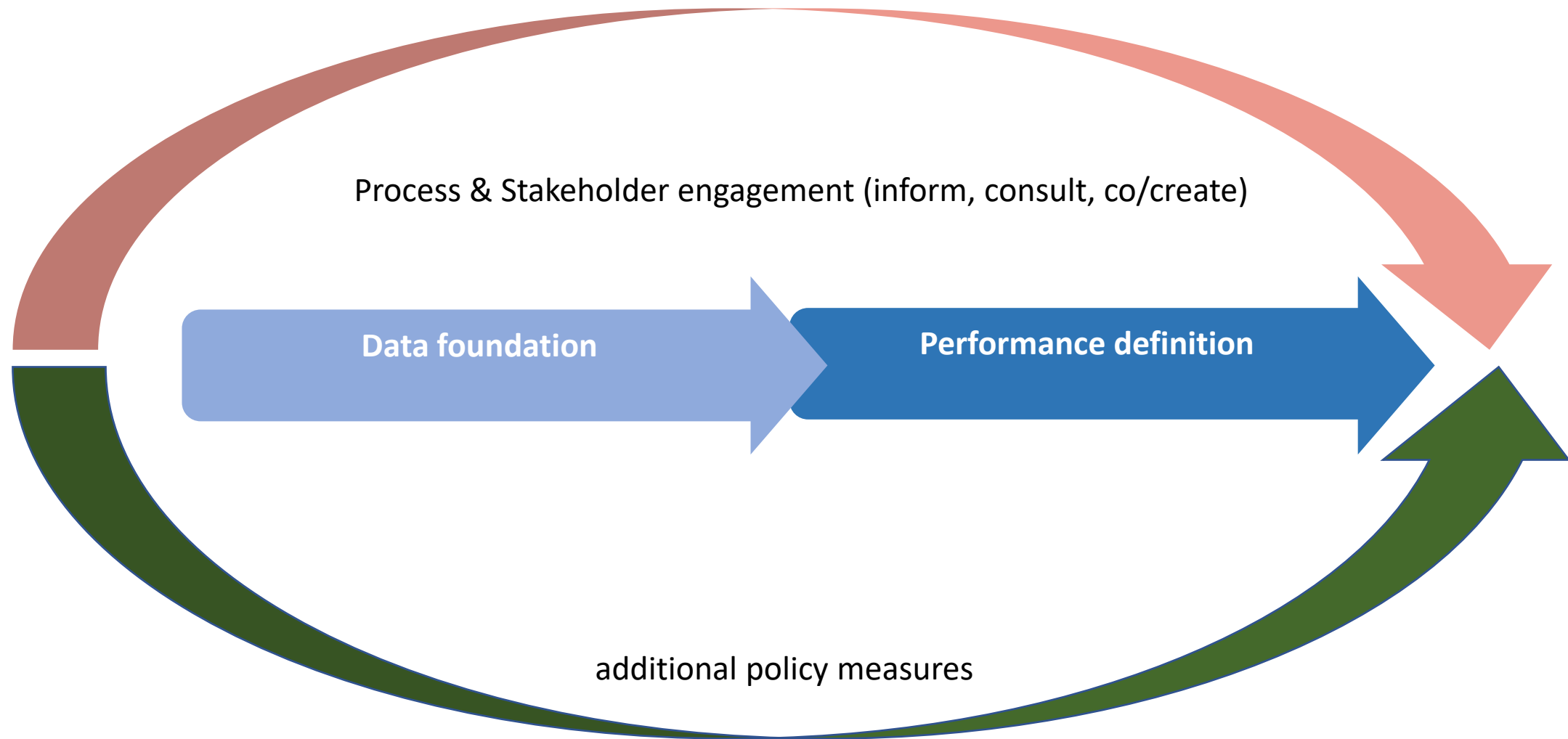Trigger points

Budget based approach
Relative approach

Additional policy measures

- Government strategy
- Subsidies / Fiscal incentives
- Capacity Building
- Portfolio standards
- WLC disclosure requirements

Policy synergies
- Circularity programmes
- Extended producer responsibility
- Digital building logbooks
- EPCs
- Green financing / taxonomy
- Local policies (e.g. city strategies)

Design Sprint Prague, Czechia

Comms workplan, WorldGBC

Comms strategy and outputs

Why?
- Message house

Who?
- Stakeholder mapping (EU and national)

How?
- Press releases
- Webinar(s)
- Website
- Social media
- Event(s)

What?
- Message house
- Comms deliverables drafting

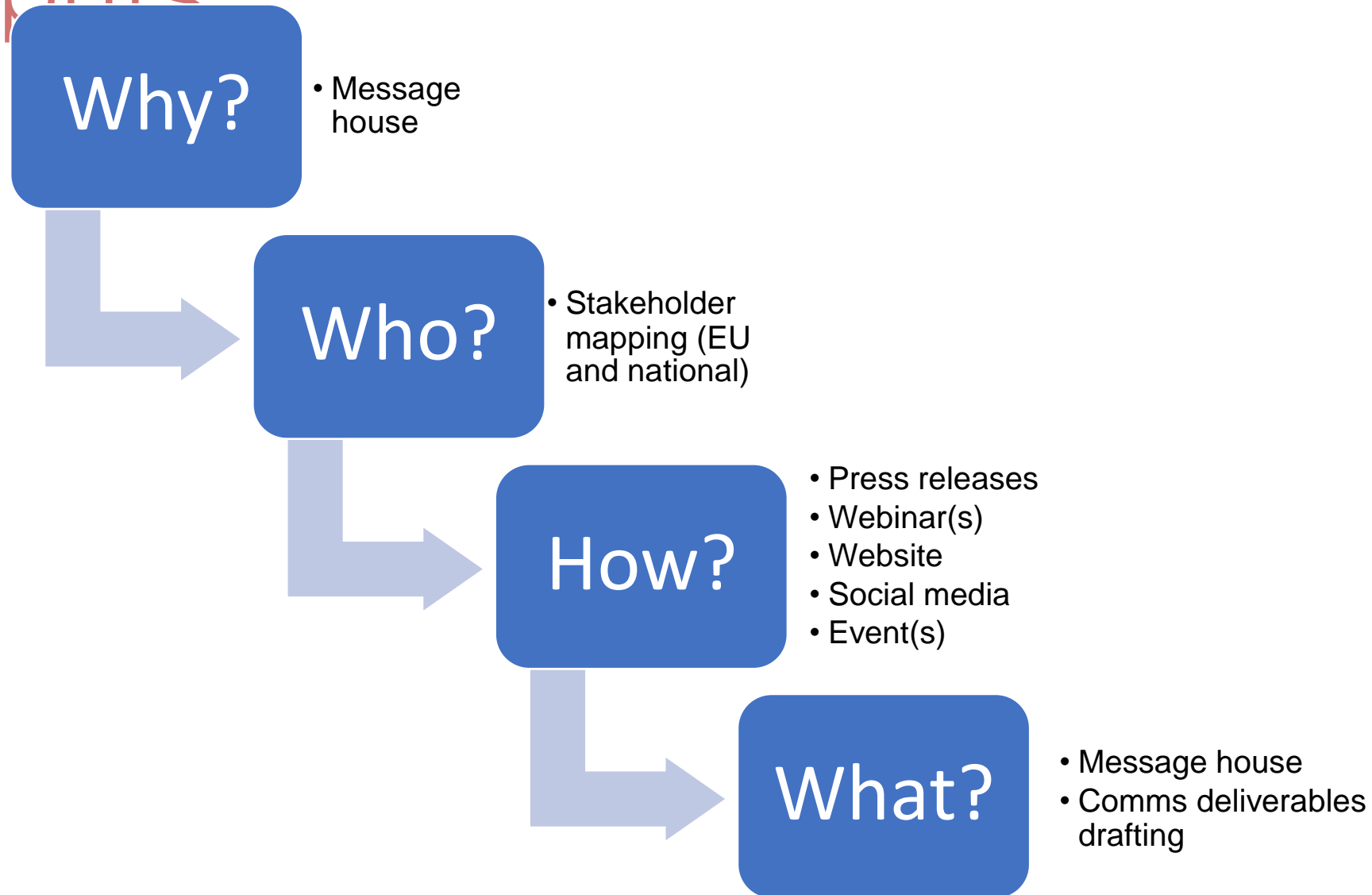INDICATE

Why? Message House

INDICATE is meeting one of the most fundamental challenges to decarbonise buildings – the lack of data! Our unique co-creation approach ensures the data generated will have the necessary buy-in to accelerate both industry and policy action.

Relevance:
- Tackling the climate-crisis demands rapid decarbonisation of the whole lifecycle of buildings. Frontrunners in industry are taking action but moving the whole sector will take robust policy
- Policy and industry change is still being held up by the lack of data to set baselines and targets - INDICATE will directly solve this barrier
- National partnerships will be forged between industry, academia and national Government
- This co-creation approach promises to ensure the stakeholders that will then act on the data and outcomes to accelerate policy and industry change

Evidence:
- WorldGBC's extensive stakeholder consultations reveal lack of data as a critical barrier to both political and industry action on whole life carbon
- Relying on industry frontrunners alone is not enough – policy is essential to reach scale
- Analysis of the few countries that have enacted WLC policies shows:
  - developing baseline data is a key first step
  - Data needs to be trusted by those who will use it
  - Co-creation and collaboration between public sector, private sector and academia offers the most promising way to secure that buy-in

Action:
- Everyone can contribute to improving the availability of data!
- Suppliers and manufacturers can ensure they provide Environmental Product Declarations for all their products
- Developers and designers can request EPDs for all products and ensure WLC assessments are performed and published for all their projects
- Public sector and political leaders can support by committing to enact WLC policy and engaging with stakeholders to find the best data and start to develop baselines.

- Bringing embodied carbon upfront, WorldGBC, 2019
- https://annex72.iea-ebc.org/
- Roadmap to climate-proof buildings and construction – How to embed whole-life carbon in the EPBD, BPIE, 2022
- EU policy models for reducing whole-life carbon of buildings, Ramboll, 2022
- EU Policy Whole Life Carbon Roadmap, WorldGBC, 2022

Who? Stakeholder mapping

- Identify most relevant stakeholders (public, private, research)
- Locate on the Influence-Interest map
- Discuss their position & arguments
- Which stakeholders communicate with each other?
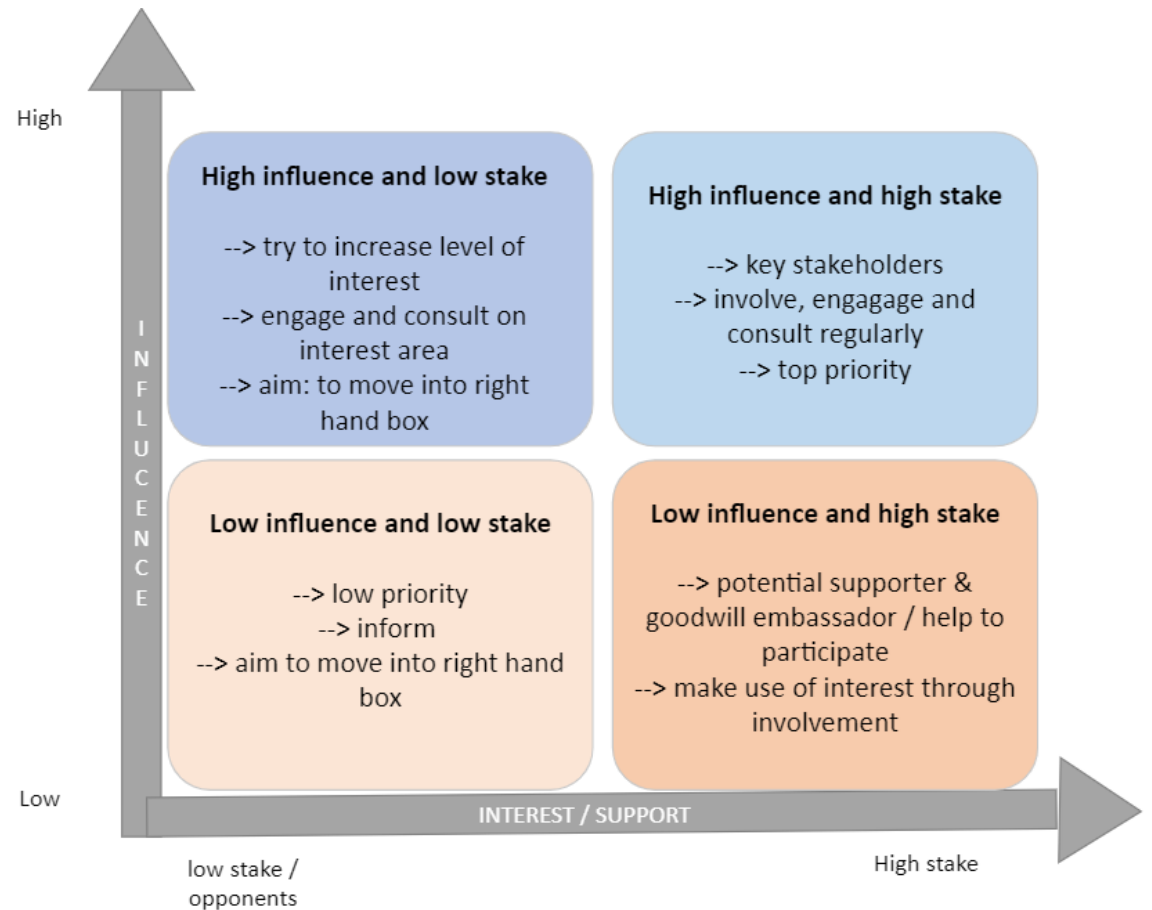
How? Comms strategy and outputs

Press Release

- To be released asap – date to be agreed w all partners

- , 1x press release and comms push by all partners

Webpage

- To be launched alongside press release

- Consist of simple landing-page and general communication templates for national initiatives such as a basic logo, typeface and PowerPoint and whitepaper/brief report template

Webinars & Events

- 1x virtual launch event (webinar) to showcase selected countries with keynote from a frontrunner country

- 1x Hybrid Brussels-based closing-event to showcase results, 1x press release and comms push by all partners, potential

- Leverage other events like COP or similar, where WGBC has a platform, to promote

What? Comms plan

- Q1 2023:
  - Website launch –ASAP
  - Press release announcing countries
  - Events planning

- Q2 2023
  - Launch webinar
  - National comms planning

- Q3 2023
  - Planning stakeholder engagement towards phase 2
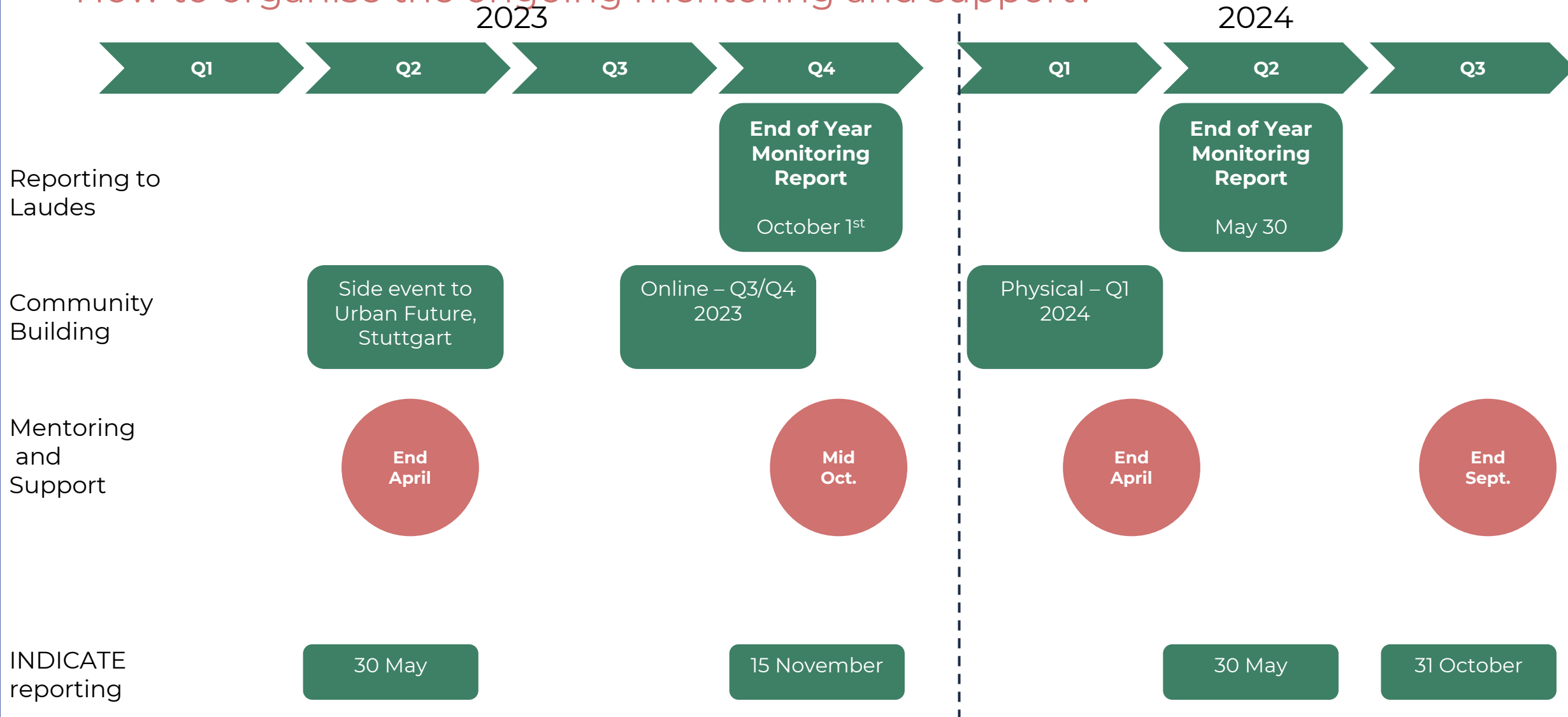
The reporting of INDICATE
Rubrics

INDICATE

Process Rubrics
A1 Design
A2 Implementation
A3 Monitoring and Adaptation
A4 Communication and Learning
A5 Organisation and Network Capacity

Early and Later Changes Rubrics	
B1 Please describe how your national project contributed to **increased engagement, preparedness, and support to build national LCA data infrastructure.**	Policy and stakeholder engagement
B7 Please describe how your national project contributed to **national datasets being accessed by different stakeholders.**	WLC data and stakeholder engement

Outcome Situation

Rubric	Previous Rating	Current Rating	Current rating justification (evidence & reasoning), including why & how ratings have changed	
B#1. Building the right processes to create strong, stakeholder-informed policy reforms Please describe how your national project contributed to **increased engagement, preparedness, and support to build national LCA data infrastructure.**	UNCONDUCIVE		Specific changes	
			How substantial and valuable	
			Contribution	
B#7. Redefined Value to refocus the system on what really matters Please describe how your national project contributed **to national datasets being accessed by different stakeholders.**	UNCONDUCIVE		Specific changes	
			How substantial and valuable	
			Contribution	

Side-event at Urban Futures
Upcomming community building events

LCA data and calculations

Obstacles and solutions

Exchange experience across the national projects.

INDICATE

Urban Future.

#UF23 Stuttgart   Tickets   Programme   Speakers   Young Leaders   Our Partners   Even

Stuttgart, Germany June 21-23, 2023

#UF

Euro

even

cities

Community Building
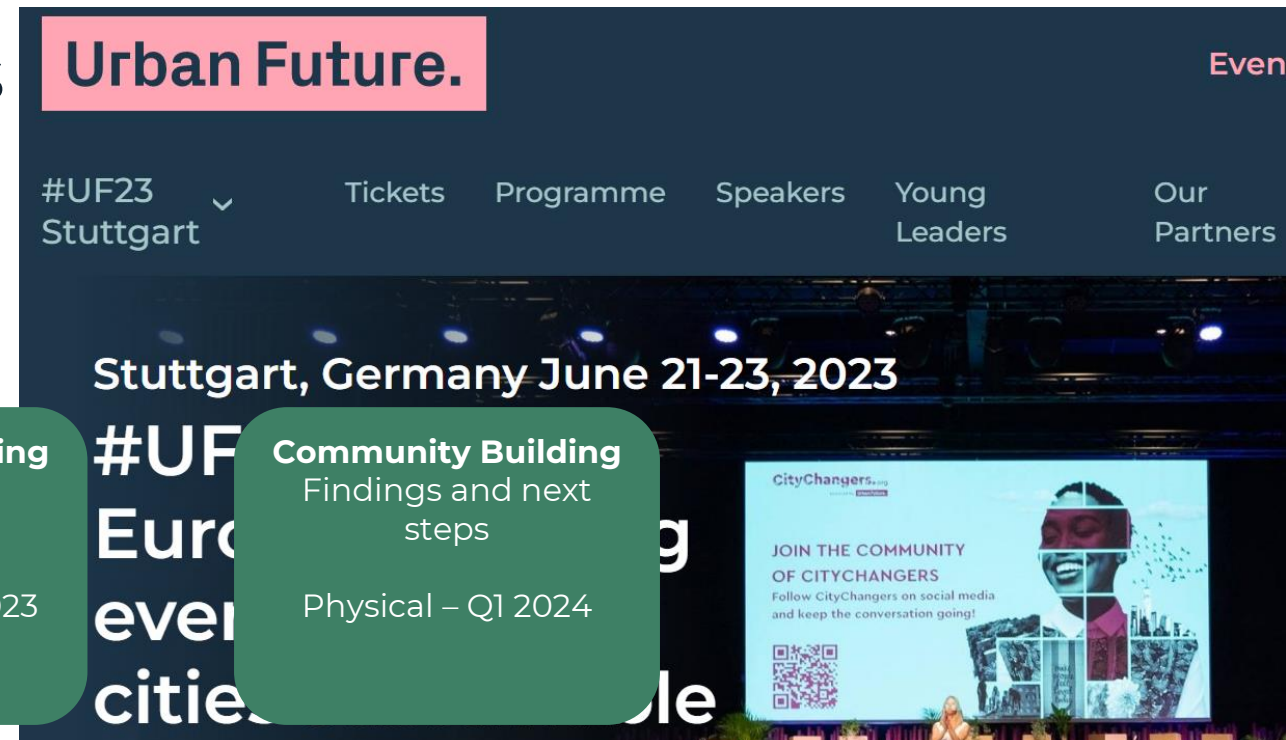LCA data and calculations

Side event to Urban Future, Stuttgart (June 2023)

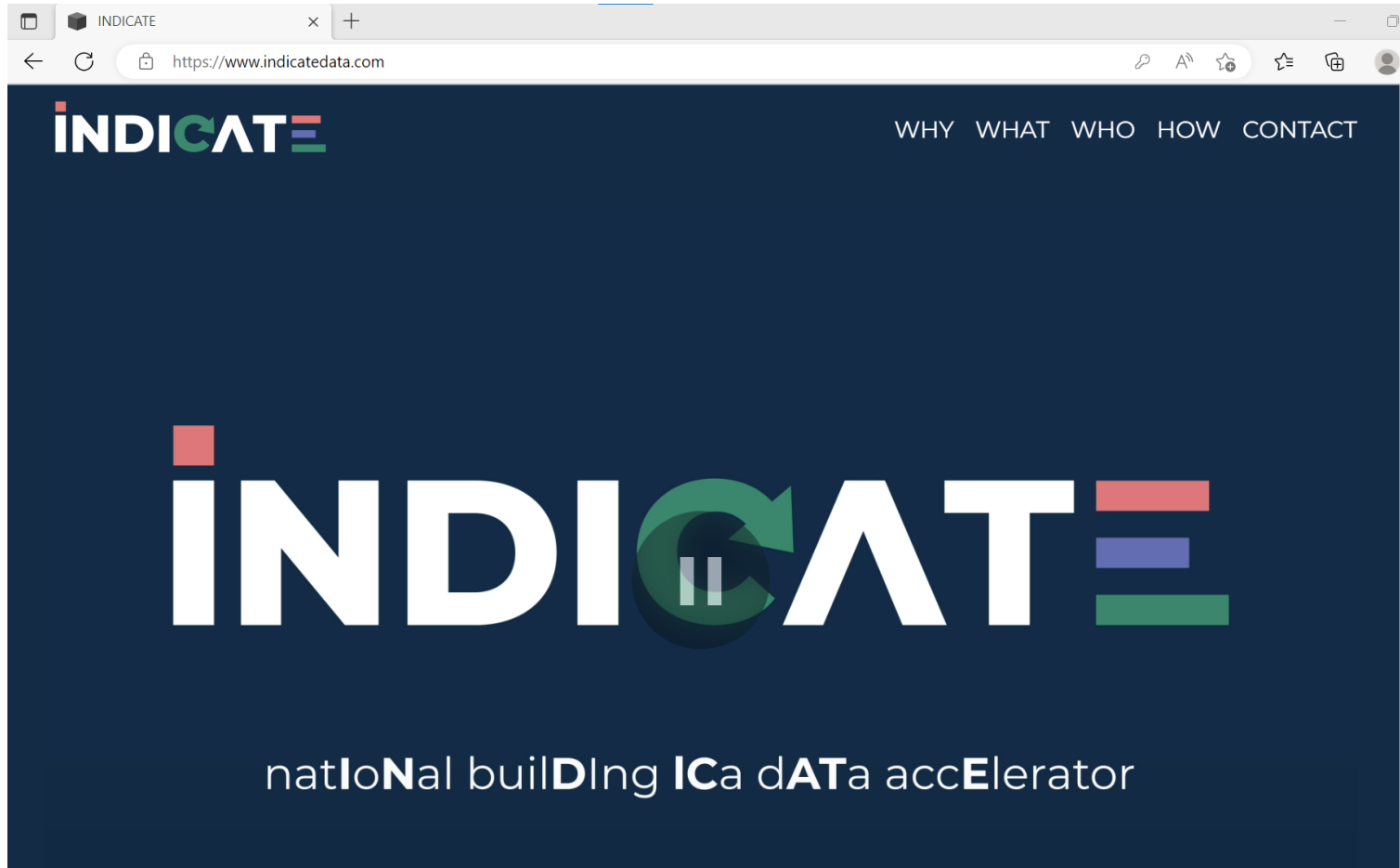**Community Building**
Stakeholder collaboration

Online – Q3/Q4 2023

Community Building
Findings and next steps

Physical – Q1 2024

CityChangers

JOIN THE COMMUNITY OF CITYCHANGERS
Follow CityChangers on social media and keep the conversation going!

LAUNCH Press release and website

- Thursday the 30th of March at 11AM CET