Opportunities to Decarbonize the Built Environment

Key action proposals from 12 European cities

CNCA
CARBON NEUTRAL CITIES ALLIANCE

One Click LCA

Supported by:

Laudes Foundation

BUILT BY NATURE

Date:	December 2023
Author:	Sara Tikka, One Click LCA Ltd Marios Tsikos, One Click LCA Ltd
Reviewer	Irene Garcia, Carbon Neutral Cities Alliance
Project:	This report has been produced as a part of CNCA's Dramatically Reducing Embodied Carbon in Europe -project

TABLE OF CONTENTS

INTRODUCTION TO THE REPORT 3
- a. Project Summary 3
- b. About this Report 3

2. ZONING AND LAND USE 5
3. EMBODIED CARBON BUILDING REGULATIONS 8
- a. MUNICIPAL BUILDINGS 10

4. SUSTAINABLE PUBLIC PROCUREMENT 11
5. WASTE AND CIRCULARITY 12
6. BIO-BASED MATERIALS 14
7. OTHER RECOMMENDATIONS 15
8. CONCLUSIONS 16

INTRODUCTION TO THE REPORT

A. Project Summary

This report is a part of Carbon Neutral Cities Alliance (CNCA) three-year project "Dramatically Reducing Embodied Carbon in Europe's Built Environment", launched in 2021, and funded by the Laudes Foundation and Built by Nature. The project aims to analyse, identify opportunities and levers, and to foster widespread adoption of ambitious local, national and regional policies that will reduce embodied carbon and increase the uptake of bio-based materials in the built environment in Europe, and serve as a model for other regions around the world.

A total of twelve European cities participated in the project. Recruitment focused on identifying the 10-15 European cities most ready to adopt ambitious embodied carbon and biobased material policies by the end of the grant term. As a part of the project, a technical assessment report was conducted for a total of 12 European cities involved in the project, reviewing the city's current laws and policies that impact embodied carbon and biobased materials predominantly in connection to the built environment. One Click LCA is responsible for technical policy reviews and support.

B. About this Report

This report summarises and elaborates on the action proposals given to the twelve European cities participating in the project. Majority of the policy actions proposed are created in connection to the "CNCA city policy framework for dramatically reducing embodied carbon" research undertaken in 2020. All the high-level embodied carbon reduction policies presented in the report are broken down into city-specific suggestions that are dependent on the city legislation and other factors, such as how land is distributed in the city and how much leverage the city has to affect construction activities in public and private sectors.

To form the recommendations presented in this report, One Click LCA reviewed multiple documents and policies from each city (listed in the table below). The recommendations presented in this document rely on the documents and information provided by the participating cities, and the knowledge on the plausibility and efficiency of different embodied carbon and biobased materials related policy measures in the areas where cities have most control over: Zoning and Land Use; Buildings Regulation and Ordinance; Municipal Buildings; Sustainable Procurement; Waste and Circularity; Bio-based Materials; Other recommendations. Further detailed information can be found in the Academy Training Course for City Officials developed by Carbon Neutral Cities Alliance and One Click LCA and freely available online in English, French and Spanish.

Table 1 Cities participating in the project and the city policies reviewed

Cities included in the project	City policies reviewed
Amsterdam	Circular Strategy 2020-2025, The Amsterdam city doughnut – A tool for transformative action, Amsterdam Circular Monitor, Overview of Dutch building regulations, Urban Development policy, Ruimtelijke plannen, The Puccini method – Standard for the Amsterdam street scene, Amsterdam Climate Neutral Roadmap 2050, City level parking policy, BENG, de nieuwe manier van bouwen, Amsterdam living policy, Omgevingsvisie Amsterdam, MilieuPrestatie Gebouwen, Duurzame Stad, Duurzame Banen Uitvoeringsagenda 2021-2022, Strategy for climate adaptation Amsterdam
Bordeaux	Charte du bien construire à Bordeaux Métropole, Plan Local d'Urbanisme 3.1 – Bordeaux Métropole, Projet d'aménagement et de développement durables, Guide de Conception des Espace Publics Métropolitains, Plan d'action pour un territoire durable à haute qualité de vie, Chantiers propres – Charte chantiers propres 2012, Label Bâtiment frugal Bordelais – Cahier Logement
Glasgow	Glasgow city council – Strategic plan 2017 to 2022, Glasgow Economic Strategy, Glasgow's Housing Strategy 2017-2022, Glasgow's Strategic Housing Investment Plan 2019/20 to 2023/24, The Glasgow Standard, Glasgow City Region Climate Adaptation Strategy and Plan, City management plan, City development plan, Our Resilient Glasgow – A city Strategy, Glasgow City Region Vacant and Derelict Land Action Plan

Helsinki	Yleiskaava 2016 ja nykyinen yleiskaavan toteuttamissuunnitelma, Asumisen ja siihen liittyvän maankäytön toteuttamissuunnitelma, Asemakaava, Kaupunkistrategia 2017.2021, Hiilineutraali Helsinki 2035 -toimenpideohjelma, Kiertotalouden tiekartta ja kiertotaloustiekartan tavoitteet, Talousarvio 2021, Maankäyttö- ja rakennusasetus, Rakennusvalvonnan lomakkeet, Kaupunkitilaohje, Rakennusvalvonnan ohjeistus rakennusten purkamisesta, Helsingin pysäköintipolitiikka, Ilmastovahti, Kaivumaiden sekä rakennus- ja purkujätteen käsittelyohje, Työmaavesiohje, Ympäristövalvonnan paikallinen ohjeistus, Ympäristönsuojelumääräykset, Rakennustyömaiden meluntorjunta ja pölyhaittojen vähentäminen, Suunnitteluohjeet, Päästöttömät työmaat – Kestävien hankintojen green deal -sopimus, Toimitilastrategia ja sen toimeenpanosuunnitelma, Att hankkeiden ohjeet ja mallit, Hekan ympäristöohjelma, Tontinluovutuslinjaukset
Lille	Plan Local D'Urbanisme intercommunal (PLU2), PLU2 – Livre IV Évaluation Environnementale, PLU2 – Livre I – Disposition générales applicables à toutes les zones, Plan Climat Air Energie Territorial – Stratégie 2030-2050, Stratégie immobilière et patrimoniale métropolitaine, Caractéristiques environnementales du BIOTOPE, Bilan 2020 – Regard sur la construction neuve et la réhabilitation de logement sociaux, L'habitat privé sur la Métropole Européenne de Lille, Renouvellement de la politique Habitat privé de la MEL, Plan de relance – Plan stratégique de soutien a la relance économique, Stratégie économie circulaire 2021-2030, Dossier de demande de labellisation Cit'ergie, Schéma métropolitain de promotion des achats publics socialement et écologiquement responsables
Lund	Lunds kommuns översiktsplan 2018 – Del 1, Del 2 & Miljökonsekvens- och hållbarhetsbeskrivning, Utbyggnads- och boendestrategi 2025, LundaEko. Lunds kommuns program för ekologisk hållbar utveckling 2021–2030, Plan för klimatneutralt byggande och anläggning – Remissversion 2022-03-01, Parkeringsnorm för cykel och bil i Lunds kommun, Lunds kommuns avfallsplan. För en hållbar resurshantering
Nantes	Cahier des prescriptions sur l'emploi du bois et des autres matériaux biosourcés, GATTE - Stratégie énergétique du patrimoine bâti VDN et NM, Note – Bati Performant, Charte Chantier durable Ville de Nantes et Nantes Métropole, Charte Chantier Responsible, Guide de prescription santé, sécurité et environnement (SSE) du bati, Rapport annuel sur la situation en matière de Développement Durable 2019-2020, Programme local de l'habitat 2019 > 2025, Plan Local d'Urbanisme Métropolitain (PLUm), Comité de pilotage Cit'ergie (réunion)
Oslo	Standard klima- og miljokrav til Oslo kommunes bygge- og anleggsplasser, Byplan Oslo, Avfallshåndtering i byggesaker, Veileder for bymessig utforming, Oslo kommunes anskaffelsesstrategi, Standard kravspesifikasjoner Oslo commune, Kriterier for vurdering av kilmakonsekvenser i planprosessen, Kommuneplan for Oslo 2018, Planstrategi for Oslo kommune 2020-2023
Stockholm	City plan, Riktlinjer för bostadsförsörjning 2021–2024, Stockholms Byggnadsordning 2021, Arkitektur Stockholm – Vägledning Balkonger, Vägledning Vindsinredning & Vägledning för kiosker, Ansökningsblankett för byggärenden, Climate Action Plan 2020-2023, Environment Programme 2020-2023, Projektera och bygg för god avfallshantering, Riktlinjer vid om- och nybyggnationer
Tampere	Tonttihakuohjelmointi 2021–2025, Hiilineutraali Tampere 2030 -tiekartta, Tampereen ilmastovahti, Talousarvio 2021 – Taloussuunnitelma 2021–2024, Tampereen strategia 2030, Anna-Kaisa Ikosen pormestariohjelma vuosille 2021–2025, Tampereen kaupungin ja Tampereen Tilapalvelut Oy:n välinen vuoden 2021 palvelusopimus, Palvelusopimusneuvottelun 2021 kokousmuistio, Tampereen asunto- ja maapolitiikan linjaukset 2018–2021 & 2022–2025 (Luonnos), Kestävän purkamisen Green Deal, Päästötön työmaa Green Deal, Tampereen tilapalvelut Oy Rakennussuunnitteluohjeet, Tampereen pysäköintipolitiikan linjaukset, Suuntaviivat asunto- ja maapolitiikan linjausten valmisteluun sekä maankäyttöpolitiikan valmisteluun, Tampereen rakennusjärjestys
Turku	Tilapalvelukeskuksen tiekartta 2029 tavoitteisiin, Rakennushankkeiden energiajohtamisen toimintamali, Tilaohjeistukset, Tilahankkeiden tarveselvitys- ja hankesuunnitteluohje, Ilmastosuunnitelma 2020 – Turun kaupungin kestävä ilmasto- ja energiatoimintasuunnitelma 2029, Turun kiertotalouden tiekartta – Kohti resurssiviisasta yhteiskuntaa 2029, Turun kaupungin asunto- ja maapolitiikan periaatteet, Infrahankkeiden tarveselvitys- ja hankesuunnitteluohje, Valtion ja Turun kaupunkiseudun kuntien välinen maankäytön, asumisen ja liikenteen sopimus 2020–2031, Turun kaupungin rakennusjärjestys, Turun kaupungin metsäsuunnitelma 2019–2029, Turun kaupunkiseudun asunto- ja maapoliittinen ohjelma 2022–2025, Yleiskaava 2020 – Kaavaselostus – Ehdotusvaihe, Turun kaupungin toimintasuunnitelma – Vuoden 2022 talousarvio ja vuosien 2022–2025 taloussuunnitelma, Pysäköinnin linjaukset 2019, Päästöttömät työmaat – Kestävien hankintojen Green Deal sopimus
Valladolid	Plan General de Ordenación Urbana 2020, Plan Municipal de la Vivienda, Plan de Acción para la Energía Sostenible, Agenda Urbana de Valladolid 2030, Ordenanza Municipal de instalación de ascensores, mejora de la accesibilidad y eliminación de barreras físicas en edificios existentes, Ordenanza municipal sobre instalaciones e infraestructuras de radiocomunicación en el municipio de Valladolid, Ordenanza sobre instalaciones luminosas particulares, Declaración responsable de obras y usos, Licencia urbanística para obras mayores, Aprobación del Proyecto de ejecución para obras mayores, Estrategia de regeneración urbana en Castilla y León, Estrategia de Adaptación al Cambio Climático, Ayudas a la rehabilitación: Eficiencia y Sostenibilidad, Plan de Acción de Economía Circular de Valladolid, Ordenanza Municipal reguladora del Procedimiento se prestación de la Inspección de Edificaciones, Estrategia de Desarrollo Urbano Sostenible Integrado (EDUSI) INNOLID

2. ZONING AND LAND USE

Zoning and land use policies are crucial in reducing the embodied carbon load of cities, as zoning defines indirectly the embodied carbon emissions of any project. Zoning and land use policies predominantly cover land sales, land lease and on what should be built and where, depending on the city's organisational model, as well as city and country jurisdiction.

Cities often have a planning monopoly and in majority of the countries cities are the only parties that can make a formal proposal for a zoning plan, where the private sector can file for an application for rezoning. However, in countries like Norway, both the city and developers may prepare zoning places. Along with the formal zoning plans, cities can impose stricter performance requirements for construction works. Zoning can restrict for example the materials used in a project and height and density of the project, affecting embodied carbon emissions in projects.

Cities often own significant amounts of land which allows the city to tie carbon requirements to transactions and development easily. Thus, the more land a city owns, the more leverage it often has. Along with land ownership, cities can enact land use changes easily via zoning privileges.

In the below table are presented all the high-level policy actions proposed to the participating cities on zoning. All the below embodied carbon reduction policies are broken down to city specific suggestions.

Table 2 Zoning and Land use policies suggested

Policy
Z1 Embodied carbon targets for zoning process
Z2 Set zoning requirements for biobased materials
Z3 Carbon-scored land sales competitions
Z4 Parking Requirement Optimization
Z7 Increasing density using existing infrastructure

Z1 Embodied Carbon Targets for Zoning Process

In the city policy framework "Embodied carbon targets for zoning process" was deemed as the most impactful one in reducing carbon across the entire construction sector. This specific policy encourages cities to require all construction with specific zoning designation to meet embodied carbon requirements set by the city. This will predominantly enforce carbon limits for all newly zoned areas but often leaves out already existing zoning.

This policy can be achieved by many smaller initiatives. For example, setting a carbon footprint target to contracts in connection to land use and land sales is one efficient way to ensure emissions are reviewed in new projects. To be able to enforce carbon footprint requirements on land use and land sales, a consistent guidance needs to be created. The viability of policy actions is dependent on city jurisdiction and other city specific matters. If the city owns a great share of land, it is easier to implement carbon regulation into for example land lease and land sales contracts. Where the share of owned land is smaller, the city can still implement policies into zoning and offer a unified methodology to measuring embodied carbon emissions.

One efficient way to reduce the embodied carbon impact incoming from construction, is to measure soil quality and give zoning priority on soil that is preferential in terms of construction. This results in steering away construction from soil types that require for example heavy foundations and thus often heavier usage of concrete and steel. Areas that cause high embodied carbon emissions should be avoided where their transport and other operational emissions are not at least counterbalancing the choice of the site.

Table 3 Policy actions suggested on embodied carbon targets for zoning process

Policy Action Suggested
Incorporate carbon footprint into land use and land sales contracts
Add embodied carbon limits to guidance
Establish zoning priority on constructible soil
Measure soil quality in zoning

Z2 Set Zoning Requirements for Biobased Materials

This high-level policy encourages cities to set zoning requirements for bio-based materials, including for example that buildings are predominantly built with biobased materials, such as wood for primary frame and/or façade. The requirements should always require use of wood from only verified and sustainable sources. Cities can also set more moderate targets that set a minimum share of bio-sourced materials, like requiring the primary structural frame of the building to be from timber for 50 % or more of the building by floor area.

This policy action might not be viable for cities that do not have sustainably sourced bio-based materials commercially available.

Table 4 Policy actions suggested on zoning requirements for biobased materials

Policy Action Suggested
Add biobased materials into tendering criteria
Set zoning requirements for biobased materials

Z3 Carbon-Scored Land Sales Competitions

Cities sell and lease land to developers and can add carbon requirements into land sales and land use agreements or for tenders for awarding said agreements. The scoring factor of a life cycle analysis for example can be set to bids with a 30 % weighing and all bidders are required to comply with the city set analysis requirements.

Table 5 Policy actions suggested on carbon-scored land sales competitions

Policy Action Suggested
Incorporate carbon footprint into city competitions

Add carbon footprint into land use and land sales contracts

Z4 Parking Requirement Optimization

Cities often have separate requirements to parking space in connection to land use and new buildings. Cities can for example reduce the minimum parking space requirements or move to a market-based mechanism for parking place capacity. The construction of parking places can become costly in projects, especially in conditions where parking has to be constructed underground or on unfavourable soil. One market-based approach to parking capacity would be for example to require all buildings to determine their need for parking places and to reserve a centralized parking place for all buildings. If the market demand for parking places is not high enough, the plot could be rezoned.

This high-level policy action can be also implemented by requiring developers to consider conversion flexibility with all parking structure if parking needs change in the future.

Table 6 Policy actions suggested on parking requirement optimization

Policy Action Suggested
Consider the conversion flexibility of parking structures in general plans
Incorporate a market-based mechanism for parking place requirements

Z7 Increasing Density Using Existing Infrastructure

Building inside an existing infrastructure is often cheaper and less carbon intensive, as old transport, water, energy and other infrastructure can be more easily modified than building new infrastructure for a new area. A density bonus works as a monetary incentive for developers to get an exemption from the zoning code to permit a building to exceed the density generally permitted in its zone. This can be done for example by increasing the maximum height or maximum floor area ratio normally permitted.

The enforcement of this high-level policy is dependent on the city's ability to enforce zoning laws.

Table 7 Policy actions suggested on added density

Policy Action Suggested
Increase maximum density if building inside existing infrastructure
Projects that demonstrate embodied carbon reductions and meet the requirements should be eligible for increases in density above the established limit

3. EMBODIED CARBON BUILDING REGULATIONS

In Europe building codes are predominantly written on a national level and cities need to enforce them by supervision. However, cities are often able to set their own supplementary requirements for construction. These requirements can be either complementary or more demanding than national regulation. There are exceptions for instance in countries like Norway and Sweden, where national legislation prohibits to a large extent cities from requirements that are above the national legislation.
The table below details the five policies that were identified during the project as the ones over which participating cities could exert most influence over all private and public construction.

Table 8 Embodied carbon building regulation policies suggested

Policy
R1 Life-cycle carbon limits for new buildings
R2 Low carbon cement and concrete policy
R4 Density bonus for carbon efficiency
R5 Zero carbon construction sites
R9 Life-cycle carbon calculation and reporting

R1 Life-Cycle Carbon Limits for New Buildings

Life-cycle carbon limits can restrict the maximum emissions that new buildings can emit during their defined lifetime. Having a set target on life-cycle emissions ensures that those targets given by regulation are set into the designs from early on, thus avoiding carbon intensive solutions.

These kinds of limits are possible to set if the city has regulatory powers and is allowed to set requirements above the national regulations. Alternatively, this can be done via land sales agreements, as mentioned in the Zoning and land use chapter of this report. Enforcing said limits will require the city to review and audit calculations as well as assign sanctions where the limits are not met.

Table 9 Policy actions suggested on life-cycle carbon limits for new buildings

Policy Action Suggested
Set limits on the maximum embodied carbon for the zoning process

R2 Low Carbon Cement and Concrete Policy

Cement and concrete are essential materials in construction and often used in large quantities. This policy action encourages cities to implement a comprehensive low carbon concrete policy to ensure the usage of performance-based concrete and to set maximum carbon performance limits for concrete by strength classes to enable a greater usage of secondary binders. This policy can also be enforced by setting maximum carbon performance limits for cements.

Table 10 Policy actions suggested on low carbon cement and concrete

Policy Action Suggested
In structures where it is mandatory to use concrete, the usage of low-carbon concrete with a higher share of recycled binders in cement should be considered.

R4 Density Bonus for Carbon Efficiency

Density bonuses are often significant financial incentives to developers. This policy action suggests cities to provide density bonuses for projects that meet the embodied carbon criteria set by the city. The density bonuses can be in the form of allowing to build additional units or to increase the floor-area ratio, if the project meets the set requirements.

Table 11 Policy action suggested on density bonuses

Policy Action Suggested
Offer a higher residential density incentive to construction that is planned in proximity of priority public transport service

R5 Zero Carbon Construction Sites

This policy encourages cities to require measuring the emissions from construction sites, both from infrastructure and building projects. This policy action would require construction sites to reduce wastage on construction site, as well as end (or substantially reduce) the usage of fossil fuels. As part of this policy cities can for example require that wastage and surplus materials are minimized in all construction sites.

Table 12 Policy actions suggested on reducing construction site related emissions

Policy Action Suggested
All construction sites to minimise wastage and surplus materials and aim for zero emissions
Considering waste as a part of climate-neutral construction site along with energy emissions from construction site machinery

R9 Life-Cycle Carbon Calculation and Reporting

Many European countries have national regulations in place for life-cycle calculations and reporting in construction sector. However, cities can often set more ambitious requirements on life-cycle assessments if compared to the national regulation. For example, in France the national regulation does not consider life cycle assessments for renovations, whereas for example cities have the power to require that in all city-owned projects.

This policy is easily implementable in city owned projects, as long as the city has a unified life cycle assessment methodology. The methodology should be taken from the national regulation if available and aim for more ambitious inclusion of various building types and sizes.

Table 13 Policy actions suggested on life-cycle carbon calculations and reporting

Policy Action Suggested
Lifecycle based assessment regulation
The whole life-cycle approach to all city owned projects over 100 m2
Calculate life-cycle carbon in connection with land leasing contracts
Life-cycle assessment on renovations

A. MUNICIPAL BUILDINGS

These high-level policies specifically target municipal buildings. Municipal buildings often preserve only a limited amount of the city's building stock, but regulation imposed on municipal buildings can work as a stepping stone for wider market adaptation and are thus efficient in reducing embodied carbon emissions across the city.

Table 14 Municipal buildings related policies suggested

Policy
M6 Renovation vs. knock-down and rebuild comparison

M6 Renovation vs. Knock-Down and Rebuild Comparison

Many city-owned buildings require renovation. Given the condition and age of the building, renovations can turn out costly and thus it might be beneficial for cities to consider knockdown and rebuilt options. Renovation vs. knock down and rebuilt should be compared in terms of life cycle emissions and costs (incl. energy), and recycling and reuse. Considering life cycle costing ensures the option is sound also for long term finances and not only carbon wise.

If a knockdown and rebuild is chosen, apply pre-demolition audit and minimum salvage requirements. Also, apply the minimum salvaged materials requirements to the replacement building. This type of policy could also be applied to rezoning requirements where an applicant proposes to rebuild the buildings.

This policy action should not be applied to buildings that are damaged or might cause a health risk.

Table 15 Policy action suggested on renovation vs. knock-down and rebuilt

Policy Action Suggested
Assess and compare emissions in all city-owned projects

4. SUSTAINABLE PUBLIC PROCUREMENT

In Europe the public procurement directive 2014/24/EU sets mandatory requirements for procurement, which include proportionality and non-discrimination. The directive also encourages the usage of performance-based requirements. Cities often have the power to organise procurement in the most convenient way, which means either by centralising it or allowing different departments to organise their own procurement in a way that best suits their purposes. The project recognized two procurement policies that cities could develop to organize their procurement in a more sustainable and circular way.

Table 16 Sustainable procurement policies suggested

Policy
P2 Green public procurement for public buildings
P6 Circular materials purchasing strategy

P2 Green Public Procurement for Public Buildings

Cities can enforce all public buildings to follow a procurement scheme that includes embodied carbon criteria. This can for example be done by requiring suppliers to provide a company-specific Environmental Product Declarations (EPDs) in compliance with EN 15804 / ISO 21930, that are third-party verified and published according to the standardization in all projects.

Table 17 Policy actions suggested on green public procurement

Policy Action Suggested
Require valid 3rd party verified EPDs for all public work and public procurement
The carbon emissions of materials used shall be analysed and the standardization should promote the usage of materials and products with life-cycle analysis performed

P6 Circular Materials Purchasing Strategy

This policy action encourages to implement a strategy to define procurement in a manner that it focuses on the whole life cycle of the product, including material efficiency, circularity, maintainability, repairability and end of life opportunities. This can be done for example by requiring all materials ordered for public works to have a defined minimum service life and that they have a maintenance, repair and disassembly strategy defined.

Table 18 Policy actions suggested on material purchasing strategy

Policy Action Suggested
Set circularity requirements for construction materials ordered for public works.

5. WASTE AND CIRCULARITY

Waste and circularity policies affect material's life cycle as a whole, as well as their end-of-life use. Where these requirements are often easily implemented at least in city owned projects, they are a key to ensure that building elements and materials can be recovered via deconstruction and reused, not just recycled. The table below highlights the three policies recognized as key for participating cities to reduce embodied carbon emissions throughout the whole life cycle of materials.

Table 19 Waste and circularity policies suggested

Policy
W1 Design for disassembly and adaptability criteria
W2 Mandatory pre-demolition audits & data sharing
W3 Mandatory material takeback program

W1 Design for Disassembly and Adaptability Criteria

Often construction materials are installed in a manner that only allows for destructive demolition, preventing material to be fully reused. A design for disassembly strategy should be conducted so that reusable materials can be disassembled in a manner that allows their efficient reuse. The city can require the design for disassembly method for key elements to be submitted for example as part of the planning and occupancy permit applications. Policies on design for disassembly and adaptability were deemed as the most impactful policies in the waste and circularity category.

Table 20 Policy action suggested on design for disassembly

Policy Action Suggested
Conduct a design for disassembly strategy

W2 Mandatory Pre-Demolition Audits & Data Sharing

This policy action encourages to establish requirements on pre-demolition audits for all demolitions and large-scale renovations. Setting these pre-demolition audits public would give material salvaging operators the possibility to see more easily what materials can be salvage efficiently and from where.

Table 21 Policy action suggested on pre-demolition audits

Policy Action Suggested
Encourage for pre-demolition audits

W3 Mandatory Material Takeback Program

Contrary to wastage from construction site, the surplus materials from the site are often unused and therefore still comply with the European CE markings. This policy action requires the commercialization of

said unused surplus construction materials. The policy action can be for example added into the construction permit as a separate condition. Under this high-level policy cities can enhance the usage of street space to hold interchangeable containers in cases where the containers have been ordered in order to re-commercialise unused surplus materials.

Table 22 Policy action suggested on surplus materials

Policy Action Suggested
The usage of street space to hold interchangeable containers should be made easier in cases where the container has been ordered in order to re-commercialize surplus materials

6. BIO-BASED MATERIALS

Cities have numerous possibilities to decrease the emissions from construction materials and increase the usage of biobased materials. Many of the policy actions recommended for bio-based materials can be tied into other embodied carbon reduction policies as well and many of the suggested policy actions also work similarly. Cities are heavily encouraged to consider the usage of biobased materials in all city owned projects, as well as to incorporate them for example in zoning requirements. These zoning requirements can be presented so that they require buildings to be built predominantly with bio-sourced materials such as timber for the primary frame or façade.

Other policy actions proposed encourage cities to prioritize the usage of timber as a predominant frame and façade material where viable and to include biobased material usage into city's standard construction requirements and plans.

All timber used must be from 100 % sustainable source. Supporting sustainable forestry is important and has the potential to increase carbon sequestration as well as mitigate for example biodiversity loss and environmental degradation.

Table 23 Bio-based material related policy action suggested

Policy Action Suggested
Promote the usage of biobased materials in public space projects whenever technically and aesthetically viable
Prioritize the use of wood as the predominant frame and façade material
Include biobased materials into strategic plans
Set zoning requirements for bio-based materials
Include biobased materials in standard construction requirements
Encouraging the use of timber in all city-owned projects

7. OTHER RECOMMENDATIONS

Other smaller policy actions apart from the City Policy Framework were recommended for the cities. These policy actions proposed are more specific and minor action points for cities to implement but nevertheless as important in achieving the city's ambitions on reducing embodied carbon from the built environment. These recommendations are dependent on each city's level of ambition.

To be able to reduce embodied carbon from processes the cities are responsible for, each city needs to communicate effectively to their shareholders what they intend to do. Thus, some of the policy suggestions below propose cities to state their embodied carbon targets clearly and consistently in their strategies to communicate them to different stakeholders, as well as to create for example guidelines for stakeholders to measure their embodied carbon in a consistent way. It is also of great interest to cities not only to measure, but to utilize feedback efficiently from projects to be able to find the best actions towards reducing embodied carbon effects.

One suggestion that differs from others in this category, was to impose an increased property tax for unoccupied properties. This is considered effective, but only works in cities where set conditions keep many properties unoccupied. Unoccupied buildings that remain empty require an equivalent amount of new construction to provide the same space to citizens and businesses, leading to an increase in embodied carbon emissions due to new construction. Imposing an additional property tax or equivalent on properties occupied less than for example 50 days per year provides an incentive to homeowners to let or sell the dwelling out. This measure can also be directed only to business properties, or hotel-like business operations.

Table 24 Other policy actions suggested for cities

Policy Action Suggested
Utilisation of feedback from completed projects
Carbon footprint into developer's guidance
Tying life cycle accounting and carbon footprint metrics into city budget
Scope 3 emissions to city level strategy for carbon reductions
Life-cycle emissions and materials with recycled content into city design guidelines
Increased property tax for unoccupied properties

8. CONCLUSIONS

Focusing on embodied carbon and biobased material related policies can support development towards supporting greener economic development and increasing liveability and wellbeing in the participating cities. Many of the suggested policies target predominantly city owned projects and can therefore work as a good stepping stone for expanding said requirements to the private sector later.

All policies recommended in the report are city specific suggestions provided considering the city policies reviewed and the national and city jurisdiction. All cities should consider the applicability of these actions depending on their ambition and jurisdictional possibilities and therefore implement the ones that are viable to their conditions. Majority of the policies can be implemented partly and widened furthermore as the city's ambition in reducing embodied carbon and increasing the usage of biobased materials increases.