



## **Background paper to the high-level conference “Reusing the Rubble”, 22 May 2018**

### **Cities at the forefront of circularity**

Expected to account for 60% of the world’s population by 2030, cities face unprecedented pressure on public health and natural capital. The UN has recognized this trend with Sustainable Development Goal 11, calling on the parties to make cities inclusive, safe, resilient, and sustainable.

Urban centers are particularly impacted by waste from construction and demolition activities (C&DW), which accounts for around 30% of the total amount of waste generated in the EU. Although the Circular Economy Package has brought some improvement, full circularity of building materials is still a long way off and more efforts are needed by Member States to meet the EU target of 70% of C&DW recycled by 2020.

Cities are well placed to improve the recovery and recycling rate of C&DW. Closing the loop on these materials would lead to major benefits for sustainability and quality of life. GLOBE EU and members of the Bee Group see a clear opportunity to build a case for circular cities to improve people’s wellbeing and address the need for infrastructure, while capitalizing on the availability of secondary raw materials from urban mining as an alternative source.

For example, cities can demand circularity in procurement contracts. Indeed, several are leading in implementing the Paris agreement through the introduction of circular roadmaps and policies. Targeted EU policies and financing incentives can positively encourage circularity at city level while meeting the expectations of citizens of a safe, healthy and sustainable environment.

Public authorities and economic actors who are willing to boost circular practices typically face the following hurdles: insufficient demand for secondary raw materials due to a lack of trust in their quality or continuous availability, logistical challenges, and ill-suited business models.

Building on the European Commission’s C&DW protocol and experiences from the EU LIFE+, ReBus and H2020 BAMB projects, GLOBE EU members, together with the Bee Group, assessed each of the aforementioned three hurdles, both from a policy and business perspective. This paper summarizes the outcomes and key learnings of two sessions, which brought together a broad selection of stakeholders and were organized by GLOBE EU to understand the opportunities that exist for boosting demand and scaling up innovative business models. Its purpose is to steer discussion, share best practices, and prepare a dialogue for future policy making that is commensurate with the size of its potential.

## How to accelerate demand for secondary raw materials

### *Key messages from the first preparatory meeting – 28 February 2018*

Different perspectives were presented on Green Public Procurement (with input from Bruxelles Environnement), material passports (with input from the Madaster Foundation), and on the use of secondary raw materials in cities (with input from the Flanders Public Waste Agency, OVAM).

**Green Public Procurement (GPP):** it was recognized that a better understanding of buildings and support systemic change by integrating changes in design culture, value definition, and collaboration (i.e., the sharing of information between all actors). GPP can also support reversible building design and the selection of recycled and recyclable materials at the end of use. Anticipating the renovation and deconstruction stage could avoid mixed waste streams, generally impairing any recycling operations (due to contamination or too high sorting cost). Indicators are important to provide information about the grade of reversibility. Changing business models means value networks instead of a value chain and raises questions about ownership versus usage and whether the building and construction sector needs to develop a more service-oriented approach.

**Building and Material Passports:** a paradigm change towards circularity is possible if we envisage that a building is merely a means to temporarily store materials. Information on materials used should be documented on an online platform in a standardized way and include a circularity index. Validated information on buildings is uploaded and can be consulted, thus creating a virtual market place for buildings components at their end of use while taking into account building components ownership structures. Information about building components helps their adequate handling across the different life stages. Additionally, building owners would benefit from being able to assess, during the design phase, the likely residual value of a building.

**Using Secondary Raw Materials in Cities:** it was discussed that urban planning should go hand-in-hand with materials recovery because cities lack space for local treatment or recycling. Some stakeholders argued that markets should be created without government interference and stated that levies on raw materials are a bad idea.

During the exchange of views, the role of public procurement was underlined as it can reward sustainability (tenders can apply financial discounts depending on the level of sustainability). Participants also acknowledged that high tipping fees for landfill are a good incentive to recycle C&DW (flat rate or depending on waste stream) but this can only work if legislation is enforced in all member states (ideally with the support of local authorities). Already existing initiatives that can be scaled-up (for new and refurbished buildings): material passports, reversible building design, circular building assessments, data sharing, and online platforms. The European Commission representative reminded participants of his work on CDW while chairing the UEPG Recycling Committee:

#### *Seven pillars of C&DW recycling:*

1. Ban landfilling C&DW
2. Implement mandatory pre-demolition waste audits (identify quality and quantity)
3. Enforced traceability C&DW to establish confidence (especially during transport)
4. Urban planning (recycling facilities within city limits)
5. Manage quality of recycled C&DW (same quality standards as virgin materials)
6. Environmental management along the entire value chain
7. Create open markets through leading example of public procurement

Other measures were discussed as options for helping to close the loop: make sorting before landfill mandatory; lifting legal impediments: harmonization of building/quality standards in the EU; encourage service models: leasing materials instead of buying; differentiated mortgage rates; responsible sourcing schemes (e.g., FSC certified timber); hotel owners, e.g., remain responsible for items replaced during renovation (similar to EPR).

## **The first preparatory meeting resulted in the following recommendations:**

### ***For existing buildings:***

Insufficient economic and regulatory incentives and a lack of trust in the quality and availability of secondary materials are stifling demand for recycled building material. A strictly imposed ban on the landfill of building materials in all EU Member States would stimulate the supply side whereas applying circularity principles to building and construction practice would boost demand. The latter could, for instance, be accomplished through fast-track approval of construction permits and easier access to capital. Cities should set high thresholds for recycled content in their public tenders and encourage the use of reusable and recyclable materials and products. Regular training of public purchasers should be mandatory.

The use of secondary raw materials should be encouraged by assuming, for instance, that buildings at their end-of-life are not a pile of waste but a material bank. GLOBE EU and the Bee Group encourage the Commission to issue guidelines on the conditions to be fulfilled for recovered or reclaimed materials to be considered a “non-waste” (similar to the conditions for by-products of manufacturing processes) so that materials such as bricks, fittings, doors, window panes, beams, etc., can be transported, stored, processed, and sold as products provided these conditions are met.

### ***For future buildings:***

Better information on what entails a building would help close the loop on C&DW and lower costs as worst case scenarios need no longer apply. Registration with a cloud-based platform of comprehensive data on buildings —chemical composition and properties of goods and materials used, construction methods, maintenance plans and safety records— would provide information for the next phase of a building and create and sustain virtual market places for used building materials. GLOBE EU and the Bee Group would welcome measures to encourage the use of these digital passports by introducing at EU level a requirement to generate a passport for every new building or renovation project. This would contribute to developing a database of available products and materials with instructions for safe handling and information on status: e.g., materials of which composition and risk have been sufficiently identified and further use is guaranteed are considered products.

## **How to stimulate innovative business models:**

### ***Key messages from the second Preparatory Meeting – March 7, 2018***

IDEA Consult presented a study conducted on behalf of DG GROW giving insight in initiatives fostering investment and innovation in construction and demolition waste recycling infrastructure; the BRIQS Foundation explained Open Building Concepts; Eurogypsum presented the G2G project and, finally, Technalia explained the HISER project.

**DG GROW study:** the study explores how the recycling of construction and demolition waste can be boosted and focuses on the more difficult business case of recycling mixed inert materials. Although entrepreneurs are interested, the EU target of a 70% C&DW recycling rate has not yet been achieved.

The study shows how the gap between entrepreneurs and the finance sector can be bridged: five business cases demonstrate the conditions for profitability. A lack of interest from the financial sector is due to the long payback period (six to eight years) and a low rate of return (the market price of recycled materials is capped by that of virgin materials). Success ultimately depends on the availability of and demand for recycled materials. The study confirms the essential role of the economics of landfilling in driving successful business models.

**Open Building Concept:** the end user is mostly absent in real estate development because of the delay between start and completion of a project. In the rental sector, it suggests that buildings need to be looked at from the perspective of, respectively, the owner (long term client) and the tenant (short term client). The diverging interests of these two owners make it important to treat them separately (two-step housing). Investors in real estate are interested in the “shell” of a building, not the interior outfit, which is considered more of a liability. Cities in Japan are more advanced in the implementation of an open building concept which recognizes that people need to adapt their living space according to changing circumstances. Japanese law requires that the remodeling of home interiors causes no nuisance to neighbors; that minimum height standards are respected and that piping is installed vertically, outside of the concrete frame, at the periphery of the home, to facilitate refurbishment. An entire industry sector has emerged around the remodeling of homes based on circularity principles: easy to remodel interiors, reuse of components, and floor space tailored to family size.

**Gypsum to Gypsum (G2G) project:** the successful recycling of plasterboard depends on the level of cooperation between individual actors in the value chain. Separating waste streams and sorting on-site is necessary but not yet standard practice. The gypsum industry is motivated to recycle plasterboards because of decreasing accessibility of traditional gypsum sources (synthetic gypsum and natural gypsum). Secondary raw materials are becoming more popular but obstacles remain (price difference with virgin materials, quality perception). Landfill fees for recyclable materials support the recycling route for plasterboard, as well as better data on the availability of gypsum based waste. An increase in recycled content needs to go hand in hand with securing sufficient volumes of high-quality recycled material.

**H2020 Holistic Innovative Solutions for an Efficient Recycling and Recovery of Valuable Raw Materials from Complex Construction and Demolition Waste (HISER) project:** the project looks at ways to overcome insufficient information about construction and materials used when demolishing existing structures. The choice of demolition techniques and management of waste materials depends on this information (Building Information Modelling). Confidence of the final user in recycled aggregates is improved by ensuring communication along the value chain, as demonstrated by Tracimat (Belgium).

During the debate, the challenges linked to the Open Building concept were underlined, notably because companies specialized in providing interior outfits can often only deal with developers, not with the end user. There is no incentive to change the traditional business model since construction companies are paid based on turnover. An initiative by the Dutch government on Industrial, Flexible and Demountable (IFD) Building Systems met with resistance because of its potential threat to existing models. Societal, economical, and cultural dimensions have to be taken into account for circular models to be successful: what works in Japan may face other challenges in Europe where ownership structure and valuing of buildings work differently.

It was underlined that legislation can help increase demand for recycled materials by providing incentives for using secondary raw materials in newly built. Governments can show the way by demanding flexibility in public procurement contracts. Additionally, initiatives by national or regional

agencies (e.g., Tracimat) to certify C&DW materials aim to provide confidence in the secondary products (traceability of how and where it has been sorted), and protect public health by avoiding cross-contamination. It can be used as an example for EU-wide programs.

Furthermore, public awareness of the potential of circularity in construction is very low. Storing information about building frames in a database (material banks) would enable consumers to decide how they want their home to be fitted out (similar to choosing options when buying a new car).

Finally, sustainability requirements in EU funding applications would help incentivize new building models.

## **The second preparatory meeting resulted on the following recommendations:**

### ***For existing buildings:***

Budget constraints force building companies to operate under time pressure. Many building components that can be re-used or recycled when carefully removed thus fall victim to the crusher instead. Specialized companies are available, however, to remove certain components within an agreed timespan and at a fixed cost (e.g., Rotor). A legal requirement or incentive for buildings to be stripped before their frames can be demolished following an assessment (pre-demolition audit) would create an entire service sector of SMEs with expertise in the removal of tiles, flooring, window frames, insulation material, sanitary items, lighting, etc.

### ***For future buildings:***

The reuse and recovery of building materials is a key principle of reversible building design. By allowing separate ownership of components with various life spans —such as lighting, flooring, windows, electrical wiring, inner walls— and facilitating their replacement and repair, reversible building design greatly extends the life of a building and enables repurposing. The introduction of reversible buildings in Japan, for example, has resulted in less C&DW and helped the development of a new business sector providing individual components for use and re-use. Encouraging innovation by adding reversible design to the conditions for competitive bidding on public works contracts and the development of EU-wide indicators and standards for reversible building design would go a long way towards more sustainable building design and use.

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