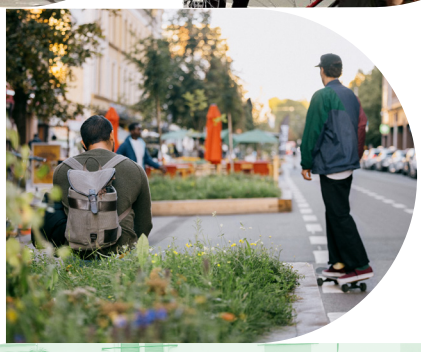
Urban Doers Community

Imperfect

Editors: Lisa Hudson-Bushart | FFG, Johannes Riegler | FFG



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Imperfect

Name of author(s)	Moujan Mahdian, Mahdi Elahi
Contact Details	https://www.imperfect.city info@imperfect.city

Abstract

Our built environment, the space we have created around us, is on a journey toward more sustainable living spaces. The EU's "Renovation Wave," a key component of the European Green Deal, aims to renovate millions of buildings to enhance energy efficiency and reduce carbon emissions. However, these large-scale renovations also generate significant environmental impacts, underscoring the need for approaches that transition away from the traditional linear value chain. Construction and demolition waste (CDW) constitutes about 40% of all waste in the EU, highlighting the urgency of adopting more circular strategies.

Local communities are eager to embrace this change but encounter many challenges. Managing construction and demolition waste is often disorganised and inefficient, resulting in low circularity rates. Communities need practical tools and systems to streamline data management, enhance process control, and support sustainable urban development.

The shift towards circularity involves rethinking traditional methods, fostering collaboration, and encouraging creativity. Communities discussing their plans face challenges like waste generation, environmental degradation, and the need for resource efficiency. They also recognise the importance of involving citizens to foster ownership and responsibility.

Despite their determination, communities struggle to find practical tools and solutions for circular construction. This highlights the need for accessible and efficient tools to guide them through the complexities of circular renovation.

Imperfect emerged from a passion for sustainable urban development. We created a platform to simplify circular renovation, empower communities and renovators, and promote bottom-up urban mining. The Imperfect platform helps identify reusable materials, plan projects efficiently, and facilitate collaboration. By providing communities with the necessary tools and knowledge, we aim to drive positive change and help local economies rely less on external parties.

Imperfect envisions a future where every building material has a story of renewal, emphasising the need for a cultural and industry-wide shift towards circularity, beginning with placing local communities at the heart of this transition.

Key lessons:

1. Empowering Tools for Communities: Practical and accessible tools empower local communities by giving them control over their projects. This independence drives sustainable practices from within, highlighting the importance of equipping people with the right resources.

2. Collaboration is Key: Effective collaboration among local governments, businesses, NGOs, and residents is crucial. By pooling diverse strengths and expertise, these groups create innovative solutions and robust networks that support sustainable initiatives.

3. Scalability is Answering the Right Questions: Scalability comes from solving core sustainability issues. By refining data management, improving material tracking, and enhancing engagement practices, circular strategies become replicable and impactful across various contexts.

4. Incentives and policies: A combination of incentives and regulations drives change. Incentives like tax breaks and grants motivate sustainable practices, while robust regulations ensure compliance. Innovative solutions through public channels can amplify this impact.

5. Imperfect but Resilient Strategies Resilient strategies must be adaptable and capable of evolving. Embracing "imperfect" solutions that can grow and adapt over time ensures communities can sustain their circular efforts, allowing for continuous improvement and innovation.

Context

Imagine a city where every part of a building, from the bricks to the beams, finds a new life instead of ending up in a landfill. This might sound like a futuristic dream, but it is actually a critical need today. Construction and demolition waste make up nearly one-third of all waste in the EU, showing just how urgent it is to change our building practices to be more circular and sustainable.

In response, the EU has launched the "Renovation Wave," aiming to renovate millions of buildings over the next decade as part of the European Green Deal. This ambitious initiative seeks to make buildings more energy-efficient and reduce their carbon footprint. However, the environmental impact of such large-scale renovations can be staggering. For instance, a single renovation of 2000 square metres—roughly the size of a school or residential building—can generate up to 100 tons of material waste, equivalent to the weight of 50 cars, and emit 200 tons of CO2, which is similar to the annual emissions of 43 cars. These figures underscore the urgent need for a new approach that minimises waste and embraces circular principles.

Ambitions

Despite the clear benefits of moving towards circular construction, local communities face significant obstacles. Many communities are eager to adopt sustainable practices but lack the necessary tools and knowledge. The process of managing construction and demolition waste is highly inefficient. The inventory process is often disorganised, leading to unstructured data that is difficult to manage. This inefficiency is not only time-consuming but also results in limited control over the process, contributing to a low circularity rate. The lack of a streamlined approach makes it challenging for local economies to effectively reuse materials, hindering their efforts towards sustainability.

Local communities, part of the local economies, are determined more than ever to embrace circular construction but face significant obstacles. From understanding circular principles to identifying and utilising reusable materials, the path is fraught with challenges. Communities need practical tools and guidance to navigate this transition. They require systems that not only support their ambitions but also address the complexities of sustainable urban development. This is where our story begins—at the intersection of ambition and innovation.

Figure 1: Inefficient inventory process. Source: Imperfect

The Journey

Let's delve into the journey of local communities, perhaps somewhere in Europe, comprising residents, NGOs, local SMEs, and renovation doers, all deeply concerned about the future of their living environments. They come together to tackle a pressing issue: how to reuse materials in their upcoming renovation projects. The challenge is daunting, and they don't know where to start. However, their resolve is strong, and they are determined to make a difference.

The journey towards circularity requires rethinking methods, embracing collaboration, and sparking creativity. As they gather to discuss their ambitious plans, they question whether they can find a solution to overcome these obstacles and truly reshape their neighbourhoods.

Pain Points

In their discussions, several key challenges quickly come to light. The community struggles with waste generation, as discarded materials accumulate and harm the environment. There is an urgent need to shift from a linear economy, where materials are used once and then thrown away, to a circular one that emphasis reuse and sustainability. They recognise the significant pollution and CO2 footprint of traditional construction methods and are committed to reducing these impacts.

They also realise the importance of citizen participation. Empowering residents to take an active role in urban development is crucial for fostering a sense of ownership and responsibility. Additionally, they see the need for resource efficiency, making the best use of available materials to ensure a sustainable future for their community. These realisations weigh heavily on them, but they also see the potential for profound change.

Despite their determination, the community faces significant frustration. They struggle to find practical tools and solutions that can help them implement circular practices in construction. The lack of readily available resources and clear guidance adds to their challenges, making the path forward seem overwhelming. This struggle highlights the necessity for accessible, efficient tools that can guide communities through the complexities of circular renovation.

Making Things Imperfect

At Imperfect, we shared this passion for sustainable urban development. Our backgrounds in resilient strategies, design, and construction project management revealed the inefficiencies and waste prevalent in traditional building practices. We envisioned a tool that could help communities transition to a circular economy, reducing waste and promoting sustainability.

Our goal was to create a platform that simplifies circular renovation and empowers communities and renovators. We aimed to develop an efficient tool to tackle the obstacles of circular renovation projects at scale. Imperfect was designed to help identify reusable materials, plan projects efficiently, and collaborate with others to achieve sustainable outcomes. By doing so, we sought to enable local economies to rely less on external parties, encourage the sharing of resources, and promote bottom-up urban mining.

We wanted to create a platform that would be accessible and efficient. We aimed to put the power of sustainable renovation in the hands of the people, providing them with the tools and knowledge necessary to drive positive change at the local level.

Circularity starts with an image

Picture this: you are standing at a renovation site, smartphone or tablet in hand, taking photos of bricks, windows, and wooden beams. Each image you capture is instantly uploaded to a platform that creates a sharable digital passport for every item, detailing its potential for reuse. This is the essence of the Imperfect platform.

Figure 2: On-site audit via the Imperfect tool. Source: Imperfect

Designed to transform urban renovation, Imperfect makes circular practices both accessible and practical. Our guided inventory tool assists users in auditing buildings and cataloging reusable materials. Project members venture out to various sites, taking pictures of potential reusable materials and uploading them to the platform. Each entry generates a digital passport, creating a detailed record of the material's reuse potential, history, characteristics and more. This documentation is crucial, providing a clear picture of available resources and sparking conversations within the community.

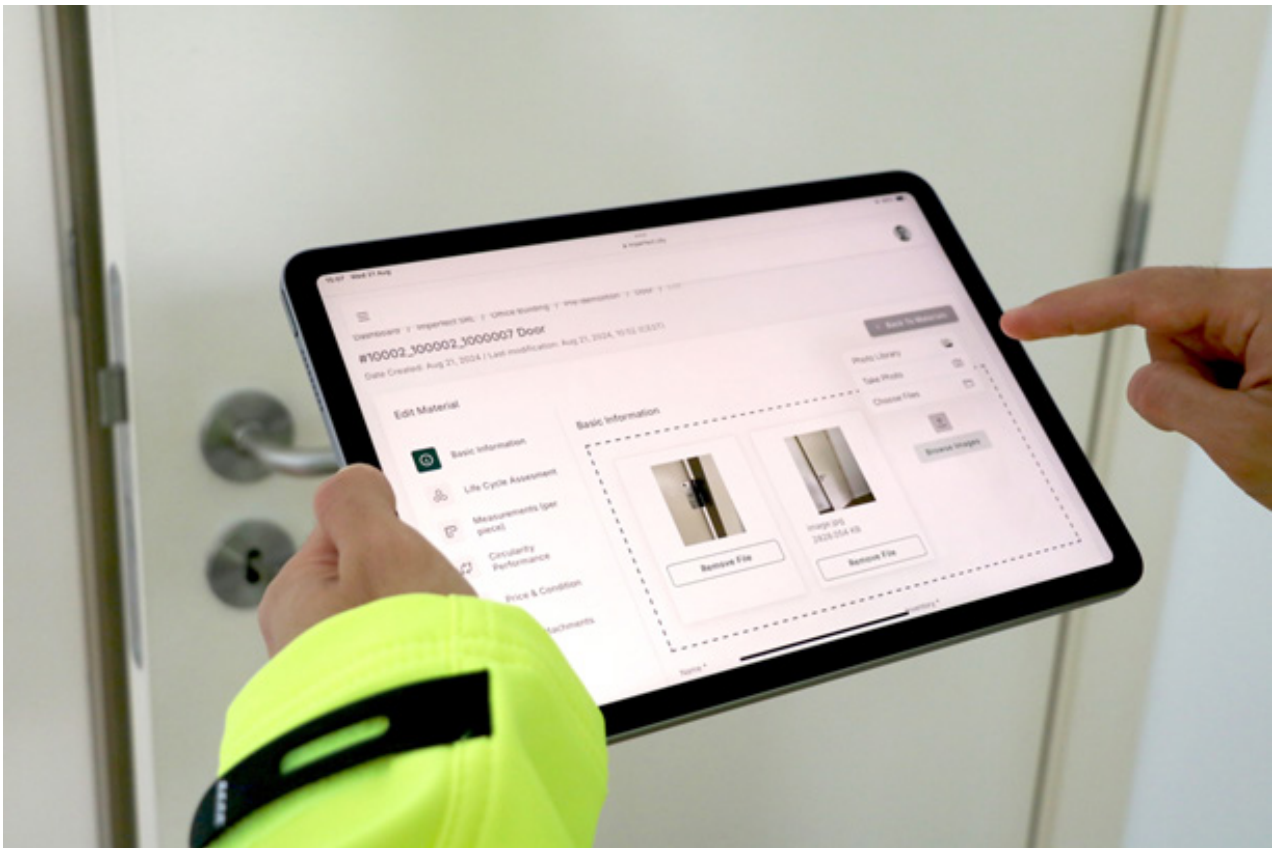

Figure 3: Efficient inventory tool in practice. Source: Imperfect

The platform supports project planning, allowing users to add team members and ensure efficient workflows. Tracking and reporting on circularity metrics, such as waste reduction and material reuse, provide tangible evidence of impact and help communities make informed decisions. This automated process enables faster and more efficient data management, making the inventory process up to 15 times faster, reducing costs by 80%, and valorizing materials.

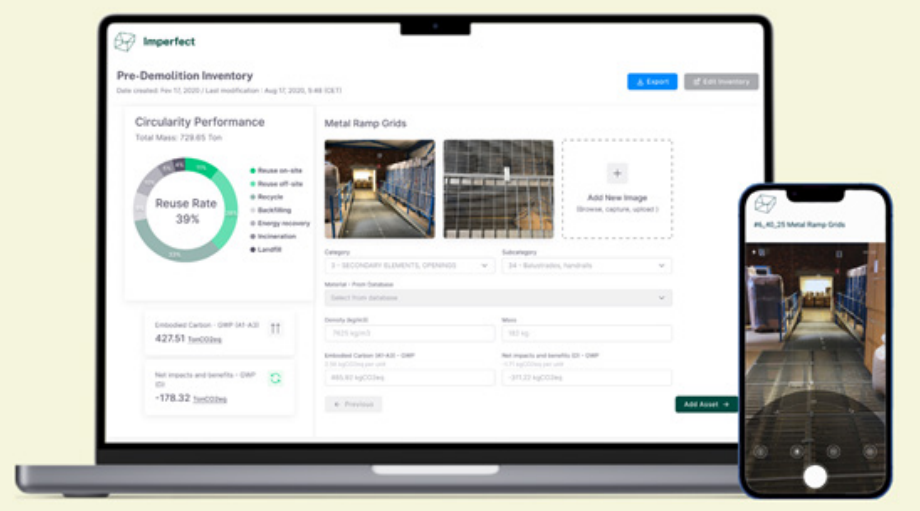

Figure 4: The Imprefect online platform. Source: Imperfect

A collaborative tool

Collaboration is at the heart of Imperfect. By enabling users to share inventories, updates, and progress reports, we cultivate a sense of shared purpose and collective action. This transparency and engagement are essential for fostering strong community bonds and driving sustainable urban transformation. The user-friendly nature of the platform makes it easy for everyone to stay on track, continue visiting project sites, capture photos of materials, and update their digital material passports. This ongoing documentation not only aids in planning but also keeps the community informed and engaged.

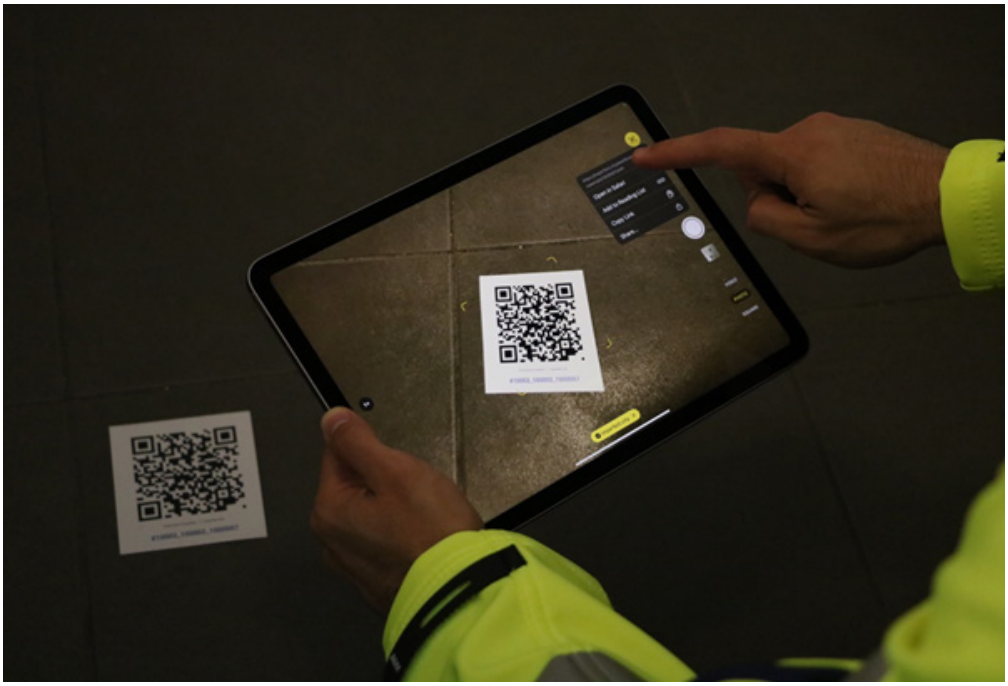

Figure 5: Digital material passports, a way to connect circular actors. Source: Imperfect

Local renovators appreciate that the Imperfect platform doesn't require any software installation or special technical expertise. It enables effortless collaboration with other stakeholders. The reclaimed material information can be easily accessed by scanning a QR code from the construction site. Automated reporting saves both time and cost, and it is possible to track positive environmental impacts.

Impact

We envision a world where every old building material gets a second chance. With the support of Imperfect, communities can transform from feeling unsure about where to start to becoming a lively group of involved citizens. Equipped with the right information, they can make smart choices about reusing materials. They can easily share their resources with others, keep track of their progress in circular practices, and take pride in what they have accomplished. In the process, they enhance their environment and build stronger connections within their community.

We enable communities to achieve remarkable results. Reused materials can be valorised at €30/m², significantly reducing waste by 40kg/m². Their high-grade circularity rate can increase by 15%, contributing to a reduction of -484 Tons CO2eq per year. The initiative can empower self-renovators and community-driven sustainable urban renovation projects and scale up the supply of reclaimed materials through bottom-up urban mining.

Figure 6: Circularity performance system. Source: Imperfect

Dissemination

The collaborative nature of the local circular renovation project can have a ripple effect, inspiring other neighbourhoods to consider similar initiatives. Communities spread their success stories, encouraging others to explore the benefits of circular renovation. The tangible results—reduced waste, cost savings, and a lower environmental footprint—can serve as compelling evidence of what can be achieved when people come together with a common goal.

To maximise impact and scale up dissemination, it is crucial to establish clear frameworks for action and support systems that enable replication of successful initiatives. While the initial results are promising, there are significant obstacles to broader implementation. Overcoming these barriers requires coordinated efforts, robust policies, and widespread education to foster a culture of reuse and sustainability.

Obstacles to overcome

Achieving a truly circular and bottom-up construction model requires more than technology; it demands a cultural and industry-wide shift. Local economies must be at the centre of this transition, actively participating, collaborating, and testing new processes. Education and awareness are crucial, helping residents understand the benefits of circularity and encouraging them to adopt sustainable practices.

Partnerships between public institutions, private companies, and non-profit organisations can significantly amplify the impact of circular initiatives. Policies and incentives that support material reuse and sustainable construction practices are essential. However, there are often more policies than incentives, especially for local-scale renovations.

Ensuring the quality and safety of reclaimed materials is a major challenge in promoting reuse. This requires robust standards and certification processes. Another critical aspect is logistics—efficiently collecting, storing, and distributing reclaimed materials. Expertise in dismantling and handling these materials is also vital to maximise their reuse potential. Addressing these challenges necessitates coordinated efforts across the entire construction sector.

Trust in reclaimed materials is paramount. By establishing transparent quality assurance processes and demonstrating the environmental and economic bene-

fits, we can encourage wider adoption of circular practices. Developing local networks for material exchange can streamline logistics and enhance community engagement, ensuring that every piece of material finds a new purpose and avoids the landfill.

For local renovators, access to a reliable supply of high-quality reclaimed materials significantly reduces costs and environmental impact. By promoting a culture of reuse, we not only preserve resources but also inspire a new generation of builders to think sustainably. Our approach at Imperfect is to provide the tools and knowledge needed to make this vision a reality. The success stories of transformed communities illustrate the profound impact of embracing circular principles and serve as beacons of hope and inspiration for others to follow.

The sustainable future is Imperfect

What if every building you see around you could tell its own story of renewal and purposed materials, weaving a tale of sustainability through its life cycle? This is the vision we are working towards.

The future of sustainable construction lies in embracing a circular economy, where materials are reused and repurposed, reducing waste and environmental impact. This vision requires more than just innovative technology; it necessitates a shift in cultural and industry practices. Local communities must be at the heart of this transformation, actively participating and collaborating to test and refine new processes. Education and awareness are key to helping residents understand and adopt circular principles.

Our experience with Imperfect has shown that user-driven innovation can effectively drive sustainable change. By placing communities and local economies at the centre, we foster strong community bonds and encourage collaborative decision-making. Our approach to urban mining, mapping, and utilising existing resources has the potential to set a global standard for sustainable practices.

We recognise the importance of continuously supporting communities in navigating new challenges. This involves deepening our understanding of effective user engagement, strengthening partnerships within the circular economy, and exploring the legal aspects of resource sharing. Our goal is to enhance our platform's capabilities, ensuring it remains a trusted tool for communities striving for sustainability.

The journey towards a sustainable future is ongoing, and while the challenges are significant, so are the opportunities. We envision a world where digital material passports become the norm for reclaimed materials, facilitating peer-to-peer knowledge sharing and driving sustainable urban transformation. The integration of certification and public premiums, where local organizations and municipalities can offer the Imperfect service to citizens, is a crucial aspect of this vision.

Our commitment to this vision is unwavering. By continuing to innovate, support communities, and advocate for policies that promote circularity, we can collectively build a sustainable future that benefits everyone. Imperfect resources may not be flawless, but they provide a perfect pathway to a more resilient and sustainable world.

Figure 7: Presenting Imperfect at Brussels Environment Meet up of Circular Construction Stakeholders. Source: Imperfect

How Imperfect can inspire you:

Empowering Communities Through Soft Interventions:

By using Imperfect, local communities are gently empowered to take action in their own environments. This approach encourages local involvement, allowing communities to become key players in the circular economy without overwhelming them. It is about making change feel accessible and achievable, fostering a sense of ownership and engagement at the community level.

Simplifying Circular Construction for Communities:

Imperfect takes the complex concept of circular construction and breaks it down into manageable, understandable steps. This simplicity aligns with what local communities truly expect and need—practical tools and guidance that make sustainable practices attainable. By making circular construction easier to navigate, Imperfect ensures that more communities can participate in this essential transition.

Circularity as a Practical Benefit, Not a "Luxury Nice to Have":

The Imperfect circular model redefines circularity, not as an expensive luxury but as a practical and beneficial approach. By focusing on the tangible advantages—such as cost savings, resource efficiency, empowerment and environmental impact—Imperfect makes the circular model accessible and attractive to all, showing that sustainability can be both feasible and rewarding.