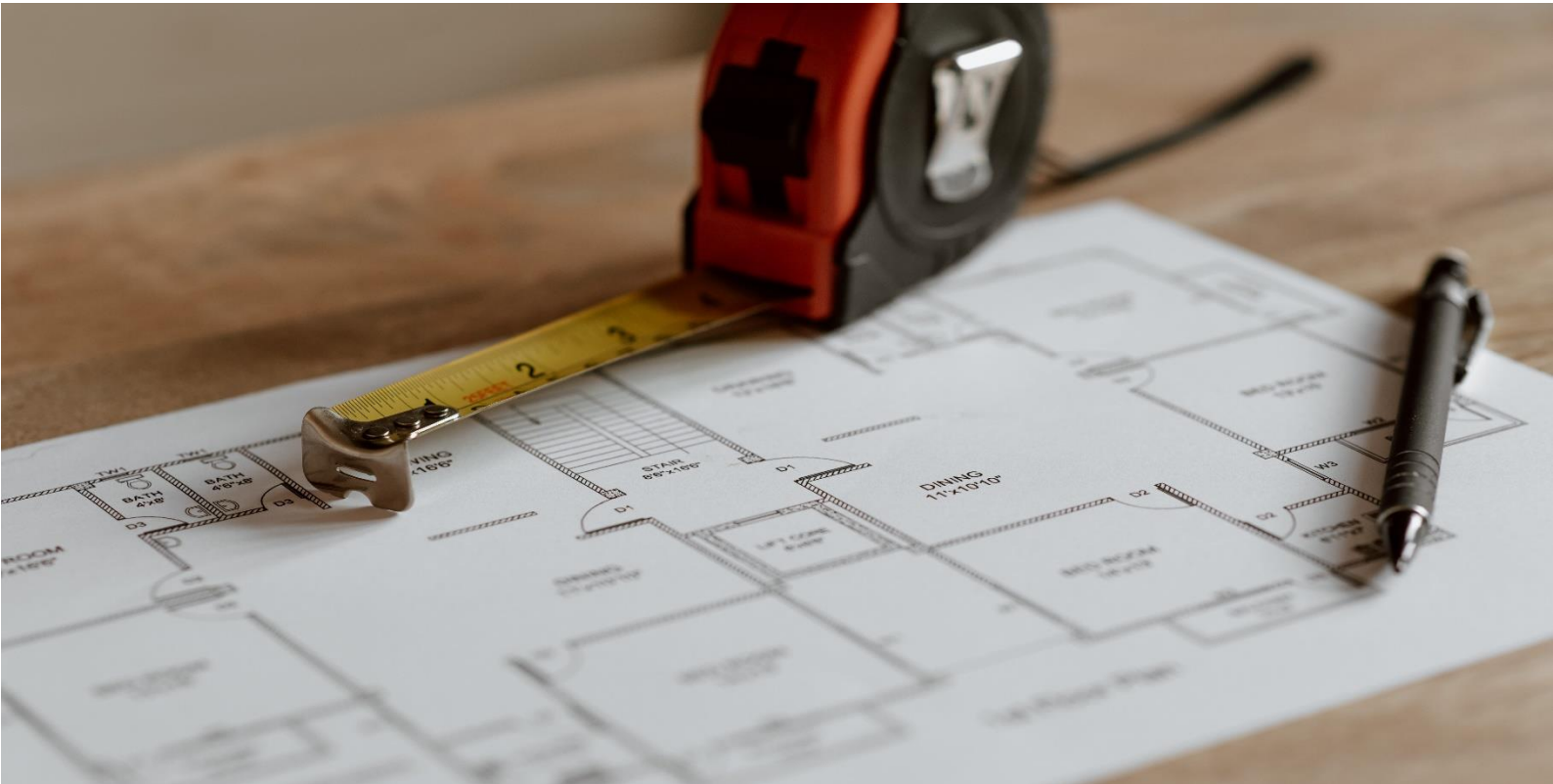


INTRODUCTORY NOTE

THE CONSTRUCTION INDUSTRY: A PROMISING MARKET FOR USED TEXTILES AND FOOTWEAR RECYCLING

September 2023



In France, the Construction Industry is responsible for almost 23% of greenhouse gas emissions¹, and is one of the key sectors in the ecological transition. For its part, the Textile and Footwear Industry is confronted with ambitious recycling and recovery objectives.

Within this context, Refashion is conducting inter-industry works with a view to accelerating the integration of recycled materials from used textiles and footwear within the Construction Industry.

The Construction Industry: a sector with a high demand for materials

A sector which presents numerous opportunities

The stakeholders consulted by Refashion all emphasize the advantages of the construction industry in developing recycling outlets for used textiles and footwear. It's a market with **extensive needs in terms of materials** and which also has the capacity to accept materials which are less pure.

In addition, a **significant upswing in bio-sourced materials²**, which include recycled cotton, serves to confirm the sector's potential.

Insulation: a promising market

Thermal insulation represents one of the construction industry's biggest markets and as such, is identified as a primary opportunity (Figure 1).

In addition to the overall growth of this sector, over recent years we have been able to observe a significant progression in bio-sourced insulation. **A 58% increase in turnover was registered between 2016 and 2020** in France (AICB³). It is estimated that 60 million m² of bio-sourced insulating materials will be used in 2025 as opposed to 33 million m² in 2021.

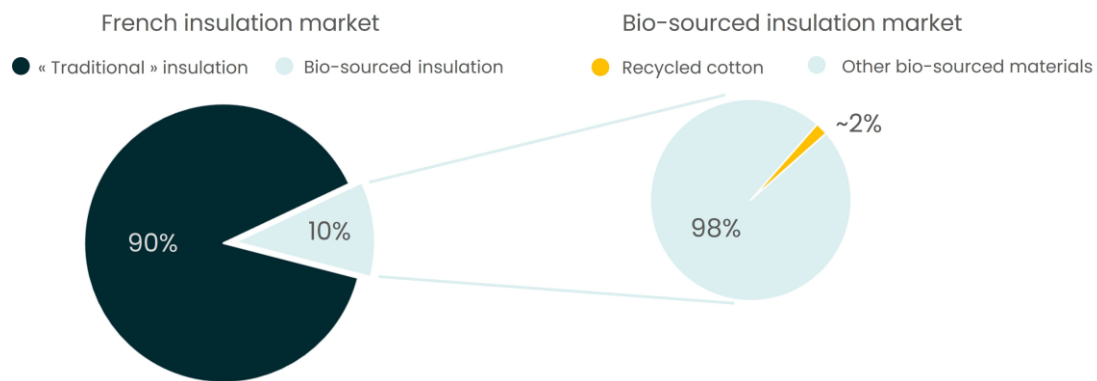


Figure 1: Proportion of bio-sourced insulating materials and of insulating materials produced from recycled cotton on the insulation market in France (data from AICB³)

Insulating materials made from recycled textiles are namely produced using cotton fibres. Their use contributes towards **reducing the environmental impact of buildings**. They permit lesser raw material extraction, a reduced quantity of waste thanks to recycling and lower energy consumption in comparison to the energy consumed to manufacture mineral wool insulation (Table 1).

¹ Ministère de la Transition énergétique. (2022, October 14). Construction et performance environnementale du bâtiment. Ecologie.Gouv. <https://www.ecologie.gouv.fr/construction-et-performance-environnementale-du-batiment> (retrieved 28 June 2023)

² Bio-sourced materials: produced from renewable resources and originating from plant or animal biomass (wood, linen, hemp, wool, recycled cotton, recycled paper, ...).

³ Boughriet, R. (2021, April 1). La filière biosourcée est prête pour répondre aux enjeux de la RE 2020. Actu-Environnement. <https://www.actu-environnement.com/ae/news/association-industriels-construction-biosourcee-AICB-hausse-marche-isolants-filiere-structuree-RE2020-37310.php4> (retrieved 6 July 2023)

Insulating materials	Characteristics	Global warming ⁴
Rock wool SAINT-GOBAIN ISOVER TF 38	Panel 100 mm – R=2.6 m ² .K/W	13.1 kg CO ₂ eq.
Glass wool SAINT-GOBAIN ISOVER GR32 Nu	Panel 100 mm – R=3.15 m ² .K/W	3.27 kg CO ₂ eq.
Glass wool KNAUF INSULATION ECOSE Aucoustilaine O35	Panel 100 mm – R=2.85 m ² .K/W	2.51 kg CO ₂ eq.
Cotton batt Métisse RT Panneaux	Panel 100 mm – R=2.5 m ² .K/W	1.65 kg CO ₂ eq.

Table 1 : Assessment of the environmental impacts (EPD) of thermal insulating materials of equal thickness and according to thermal resistance (R)

Cotton batt insulation is now well-established. In addition to the ecological aspect, these products offer numerous benefits (Figure 2):

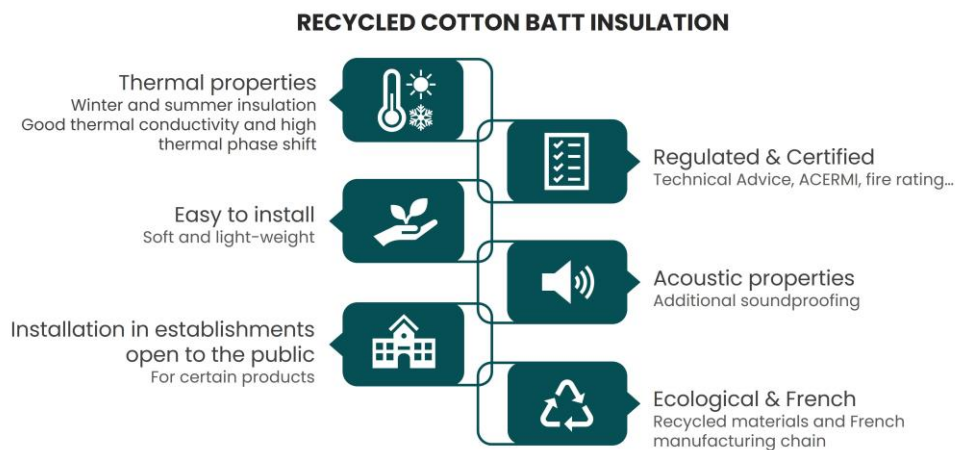


Figure 2: Advantages of recycled cotton in the production of thermal-acoustic insulating materials

Refashion’s [characterisation study of the incoming and outgoing streams from sorting facilities](#) shows the predominance of cotton in non-reusable textile waste (43% in weight). These figures serve to confirm the **availability of this material for the development of insulation.**

Within this context, several manufacturers are planning to increase their production capacities in order to accompany this growth dynamic.

The plastics processing sector: a promising market

In Europe, the Construction Industry is the 2nd largest consumer of plastics behind packaging, with more than 10 million tonnes used every year⁶. We can also observe an increase in recycled plastics present in Construction Industry products from 14.4% in 2018 to 18.1% in 2021⁶.

⁴ Functional unit (FU): thermal insulation of walls over 1m² for a reference life duration of 50 years.

Global warming indicator taken from EPD data (Environmental Product Declaration) in the INIES database (French national reference database for environmental and health data on construction products and equipment). Criteria obtained via LCA (Life Cycle Analysis) which is based on French and European standards to quantify the resources consumed and the substances emitted throughout a product life cycle to assess its environmental impacts.⁵

⁵ INEF 4. Fiche pratique - Economie circulaire des produits d’isolation biosourcés | Ekopolis. <https://www.ekopolis.fr/ressources/fiche-pratique-economie-circulaire-des-produits-disolation-biosourcés> (retrieved 11 August 2023).

⁶ Plastics Europe. (2022, October). Plastics - the Facts 2022. https://plasticseurope.org/fr/wp-content/uploads/sites/2/2023/02/PE-PLASTICS-THE-FACTS_FINAL_DIGITAL-1.pdf (retrieved 7 July 2023).

The development of technical products from plastics contained in textiles and footwear could provide a substitute for current plastics which are mostly produced from virgin raw materials.

These elements therefore enable us to envisage numerous outlets for the plastics processing sector and industry players are striving to position themselves on this sector in the medium term.

Focus: footwear recycling

Today, projects to recover materials from used footwear are mainly at the R&D stage. The most advanced projects concern recycling trainer soles (rubber, PU foam, EVA,...) for sports and playground surfaces or underlays. However, these markets remain small with significant price barriers.

Development at an industrial level would require the stabilization of streams which current separation and footwear component characterisation techniques do not yet permit.

Identified brakes to integrating recycled materials

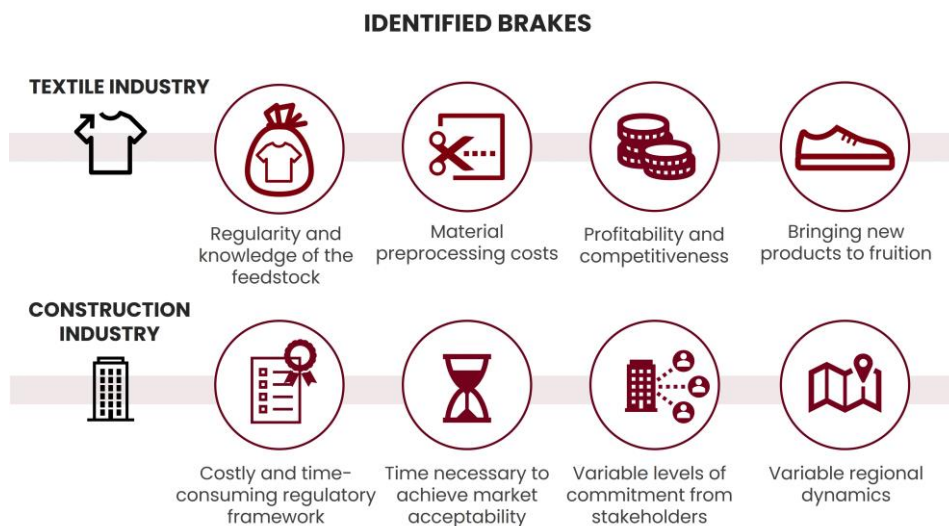


Figure 3: Brakes to integrating recycled materials from used textile and footwear into construction industry products

A Textile Industry which needs to be structured

To meet the requirements of the construction industry, industry players have identified a need to ensure **regularity with respect to the quality and quantity of the feedstock available for recycling.**

In addition, numerous transformation stages along with the accumulation of middlemen in the production chain make the products produced from post-consumption textiles and footwear less competitive. Nevertheless, on the insulation market, **the difference in price between recycled insulating materials and traditional materials is tending to decrease** (Table 2). The rising price of energy has led to an increase in production costs with respect to glass wool insulation.

Insulating materials	Characteristics	Price (including VAT)*
Rock wool ROCKWOOL Rockmur	Panel 100 mm – R=2.85 m ² .K/W	€11.60/m ² (1)
Glass wool SAINT-GOBAIN ISOVER Murs 032 Kraft	Roll 100 mm – R=3.15 m ² .K/W	€12.59/m ² (1)
Cotton batt Métisse (LE RELAIS)	Panel 100 mm – R=2.5 m ² .K/W	€13.82/m ² (2)
Cotton batt PAVATEXTIL (SOPREMA)	Panel 100 mm – R=2.5 m ² .K/W	€15.02/m ² (1)
Cotton batt SAINT-GOBAIN ISOVER Isocoton	Panel 100 mm – R=2.7 m ² .K/W	€14.08/m ² (3)

Table 2 : Price of mineral and recycled cotton batt insulation of an equal thickness and according to thermal resistance (R)

*Prices as at August 2023 at Leroy Merlin (1), Castorama (2), Point P (3)

A balance needs to be found to meet the requirements of the Construction Industry

Certain industry players perceive the standards necessary for the authorisation of products for use in the construction industry as **restrictive, long to put in place (2 to 3 years) and costly**. This curbs their desire to launch themselves in this sector.

In spite of a huge demand for materials, bio-sourced and recycled products are finding it difficult to carve out a niche owing to a **lack of knowledge regarding such products and an element of vigilance**. Tradesmen are also used to working with certain materials and using new ones can mean modifying their working methods. This phenomenon is namely illustrated by the **lack of use of such products in orders placed for public works**.

Major and **influential stakeholders are also hindering the emergence** of smaller, independent stakeholders.

Contracting authorities have a key role to play in mandating these materials. It must be noted that the **notion of “turf” is important**: depending on the region or city, sustainable planning dynamics, which condition the sector’s progression, differ.

Future prospects and levers for action

To ensure progression, all sorting, design, production and project owner stakeholders need to get involved, in order to work on:

- The availability and the stability of used CHF feedstock;
- The financial profitability of products made from recycled materials to ensure that they are competitive;
- The development of new products;
- The acculturation of the Construction Industry ecosystem to products already developed;
- The accompaniment of new stakeholders in standardising their products;
- The integration of products made from textile and footwear recycling in low carbon policies.



The purpose of the Refashion Recycle platform is to enable Textile and Footwear Industry stakeholders to contact each other in order to accelerate the industrialisation of non-reusable clothing and footwear recycling. Through its workshops and webinars, Refashion is building bridges between companies that offer materials and industrials that will incorporate them into their production processes.