



Asphalt – A Key Construction Product for the European Circular Economy



EAPA
Position Paper



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1. European policy on Circular Economy

In 2020, the New Circular Economy Action Plan [1] was published by the European Commission, stating that in order to fulfil the environmental ambitions of the EU, listed in the European Green Deal [2], Europe needs to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes, advance towards keeping its resource consumption within planetary boundaries, and therefore strive to reduce its consumption footprint and double its circular material use rate in the coming decade.

As included in this Action Plan, this progressive, yet irreversible transition to a sustainable economic system is an indispensable part of the new EU industrial strategy. For example, a recent study estimates that applying circular economy principles across the EU economy has the potential to increase EU GDP by an additional 0.5% by 2030 creating around 700 000 new jobs [3].

This is especially relevant for the construction sector, which requires vast amounts of resources and accounts for about 50% of all extracted material and over 35% of the EU's total waste generation [4]. In addition, greenhouse gas emissions from material extraction, manufacturing of construction products, construction and renovation of buildings are estimated at 5-12% of total national GHG emissions [5]. Greater material efficiency could save 80% of those emissions [6].

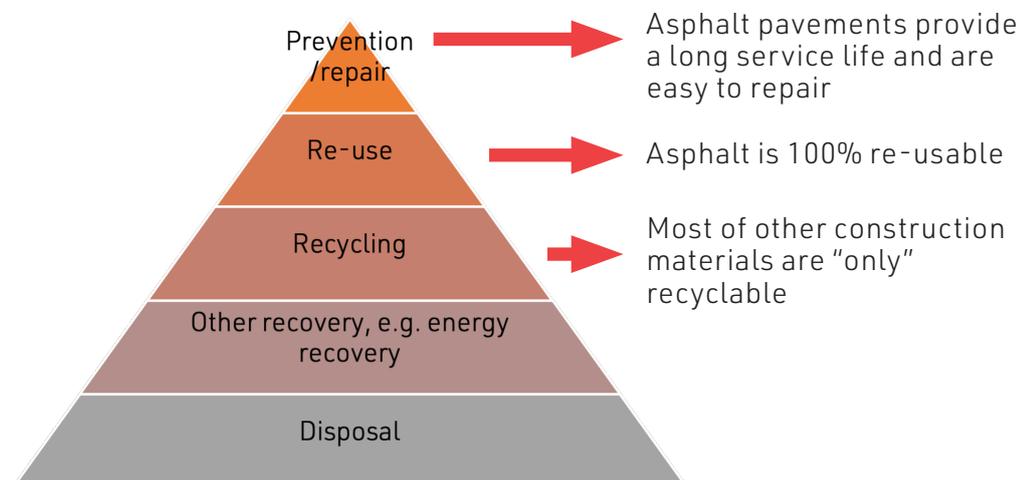
2. The Circular Economy of Asphalt Roads

European roads support the transport of 81% of passengers and 73% of inland freight. The main impact during the life of a road is the greenhouse gas emissions from vehicles riding on it. Hence, for a highly trafficked road, the embodied impacts of construction and maintenance are just 1 or 2% (or even less than 1% for very high traffic volumes) of the total impact over, say, 30 years.

Nevertheless, road impacts also include others, such as the exploitation of natural resources and the production of waste, which can conflict with the principles of circular economy and therefore, should not be ignored.

The managing and disposing of waste are regulated under the umbrella of numerous national and European regulations, such as the Directive 2008/98/EC on waste (Waste Framework Directive), in which a hierarchy was defined establishing the following order at the top: (1) prevention & repair, (2) re-use and (3) recycling.

By following this hierarchy, the most sustainable strategy for asphalt roads is simply to prolong their service life, preserving the asphalt as long as possible in the road, thereby reducing the need to remove it at all. A pavement preservation or asset management strategy involving simple, timely and cost-effective surface treatments to retain the asphalt integrity before later more costly re-



Asphalt within the waste hierarchy established by the Directive 2008/98/EC

pairs or rebuilds makes economic sense. If a road is properly designed, constructed and maintained and lasts for twice as long, then 100% of the virgin materials which would have been used to reconstruct it have been preserved.

In this regard, asphalt industry has developed over decades a wide range of options. In the EAPA Technical Review on the Circular Economy of Asphalt [7], detailed information can be found on preventative techniques (e.g., sprays, surface dressings, micro & slurry surfacings and thin surfacings), as well as repair techniques (e.g., potholes patching and filling, inlay, planning and re-surfacing, overlay and full reconstruction).

By using these techniques, it is possible to significantly extend the service life of the road surface and make the bottom structural layers practically perpetual. However, still nowadays, numerous Administrations prioritise the funding for new construction before the maintenance of the existing road assets, which in most cases lead in time to higher environmental impact and reconstruction costs.

When previous preventative and repair operations are no further effective, asphalt reaches the end of its service life, and it is ready to be extracted from the road.

The reclaimed material is (in general) not suitable to be used straight away, requiring some intermediate processing. Hence, the Asphalt Product Standard EN 13108-8 "Reclaimed Asphalt" differentiates the concept of "site-won asphalt" (often-known as reclaimed asphalt pavement or RAP) from "reclaimed asphalt", as follows:

- **Site-won asphalt:** the material to be recycled, in the form of milled asphalt road layers or as slabs ripped up from asphalt pavements, or being asphalt from reject, surplus or failing production.

Note to entry: These materials will require assessment and often processing before being suitable as a constituent material.

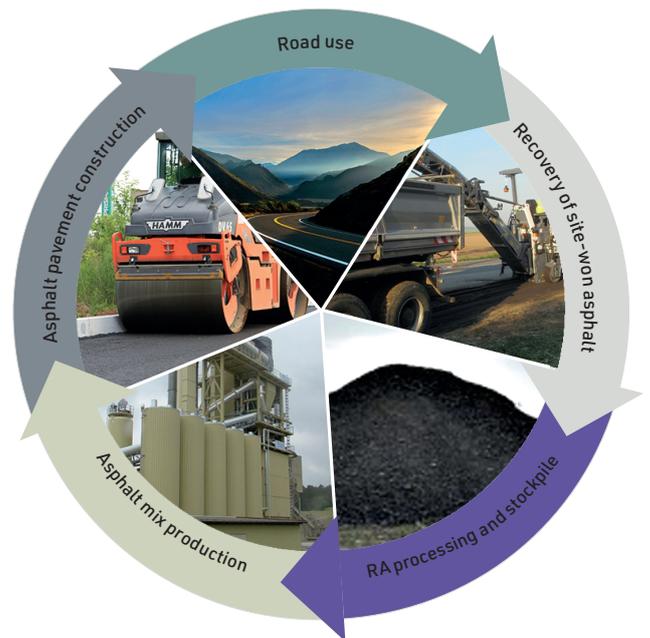
- **Reclaimed asphalt (RA):** the processed site-won asphalt, suitable and ready to be used as constituent material for asphalt, after being tested, assessed and classified according to this standard.

Note to entry: Processing can include one or more of: milling, crushing, sieving (screening), blending, etc.

Once the reclaimed asphalt has been obtained, it is ready to be re-used or recycled. By following the principles of the Waste Framework Directive, EAPA defines:

- **Asphalt re-use:** operation by which reclaimed asphalt (RA) is reincorporated into the pavement, with the aggregates and the aged bituminous binder performing the same function as in their original application.

Note: This is independent of manufacturing temperature, road layer, etc. Hence, it would include, for example, the manufacturing of cold mix asphalt from former warm or hot mix asphalt.



The circular economy of asphalt

- Asphalt recycling:**
 operation by which reclaimed asphalt (RA) is used as foundation, fill or road material, with the recovered aggregate and bitumen performing a lesser (or alternative engineering) function than in the original application.

Note: This means that, traditionally, the term "recycling" has been mistakenly used to also refer to "re-use" operations.

The especial characteristics of asphalt, mainly composed of aggregates and a binder (normally bitumen), which softens when heated but behaves like a solid at ambient temperatures, make it easy to repair and, at the end of its service life, 100% re-usable and recyclable for several cycles. In addition, it has been also demonstrated possible to build certain types of roads with up to 100% of only reclaimed material.

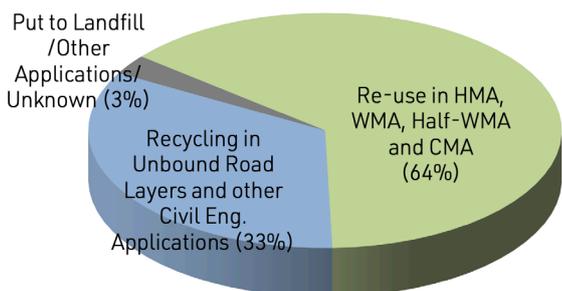
When asphalt is recycled, it is normally used as an aggregate in other construction products. These include aggregates for railway ballast and armourstone, but more usually as aggregates for unbound mixtures, such as sub-base and fill materials for civil engineering works or as unbound mixtures themselves. When recycled asphalt is used in other materials, there will naturally be quality limits and requirements in the specifications for the destination material, particularly relating to the retained binder content. Recycled asphalt can even be used as aggregate for concrete but clearly this does not exploit the inherent value of the bitumen content.

Nowadays, as detailed in the EAPA annual publication "Asphalt in Figures" [8], the total amount of reclaimed asphalt available for the industry in the

European reporting countries in 2020 was 46 Mt. A great deal of these countries¹ also measured the percentages of the total RA available for the industry, which were "re-used" for the manufacture of new mixes, "recycled" as unbound road layers and other civil Engineering applications and used in other unknown applications or put to landfill. In these countries, 64% of the available RA was re-used and 33% recycled. This means that only 3% was used on unknown applications or put to landfill, which raises the asphalt sector to the top level of circularity.

Considering these exceptional figures (as most of other construction materials can "only" claim to be recyclable), and that more than 90% of the European road network is surfaced with asphalt, it is clear that the European asphalt industry has the potential to become a key tool for Road Authorities and Governments to achieve objectives of the new Circular Economy Action Plan, such as:

- Increasing re-used and recycled content in products, while ensuring their performance and safety
- Enabling remanufacturing and high-quality recycling
- Reducing carbon and environmental footprints
- Restricting single-use and countering premature obsolescence
- Improving product durability, reusability, upgradability, and reparability, addressing the presence of hazardous chemicals in products, and increasing their energy and resource efficiency.



Application of reclaimed asphalt available in European countries providing data in 2020

4. End-of-waste criteria, a barrier for asphalt circularity

The Waste Framework Directive defines "waste" as "any substance or object which the holder discards or intends or is required to discard".

¹ Countries providing data are: Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Norway, Romania, Slovakia, Slovenia, Spain and Turkey.

The general interpretation applying to asphalt in most of European countries is that the owner (i.e. Road Administration, Public Agency, Ministry, Municipality, etc.) intends to remove the material from a given road before a further construction/maintenance operation but without having any specific purpose or intention for its further use. Therefore, the definition given by the Waste Directive automatically applies and the material is classified as “waste”. Although then, the contractor typically becomes the new owner, the classification does not automatically change.

Such classification involves the application of a waste regime, which can make difficult the use of reclaimed asphalt in the manufacturing and maintenance of roads or into other applications of civil engineering. In addition, the handling of this material becomes more complex, for example due to increases in testing frequency or limitations on maximum storage capacity, storage time, applications, etc. This normally results in lower efficiency and higher costs. In other words, these regulations can themselves be a barrier for the circular economy in paving engineering.

On the other hand, the waste classification is reversible in some other European countries, which have recently established (or are in the process of establishing) legal mechanisms to change the classification of site-won asphalt, from “waste” to “product” or “by-product”. In these cases, the change of legal status usually happens when the site-won asphalt is processed into reclaimed asphalt (i.e. through cleaning, crushing, sieving, etc.) and as long as a series of “end-of-waste” criteria are met.

Unfortunately, these criteria can significantly vary from country to country, depending on specific national regulations. In addition, as this is a hot topic related to European priorities, most National Administrations across Europe are nowadays developing new legal documents, which makes the current European legal framework extraordinarily complex and under constant revision.

An increasing number of countries are establishing regulations, which clearly state when site-won asphalt can stop being classified as waste, based on well-defined principles.

A good example is Czech Republic, which in 2019 published the public edict No. 130/2019 Col. In this, it is stated that, if the owner of the road is able to declare that the asphalt layers to be milled or deconstructed are not hazardous (e.g. by identifying the PAH content), the extracted material can automatically be declared as a “by-product”.

This huge step forward has also advantages for the Administrations. For instance, it contributes to the objectives and measures proposed by the Waste Framework Directive and the amending Directive 2018/851 mentioned above. In addition, the non-declaration of site-won asphalt as waste avoids the need of an extra budget for waste handling, storage, processing and/or disposal.

Examples of other countries, which have recently advanced their national regulations in this direction are Belgium, Italy and The Netherlands.

5. Preserving 100% re-usability

It is important to highlight that, although the strong EU policy on Circular Economy can facilitate the use of reclaimed asphalt for the construction and maintenance of new roads, it can also boost a series of initiatives aiming at introducing a wide range of different by-products and waste materials from other sectors into asphalt. In this sense, EAPA has been warning over the last years, about the negative consequences that some of these products may produce into asphalt, especially in terms of quality/durability, environmental impact and health and safety of workers/operators [9].

The use of some waste materials and by-products into asphalt, could even endanger its re-usability and recyclability at the end of its service life. Therefore, and despite seeming paradoxical, the use of such materials could contradict the principles of circular economy, as it would make necessary to dump into a landfill, a material that otherwise would be 100% re-used and/or recycled several times.

6. EAPA position and recommendations

The wide range of preventative techniques developed by the asphalt industry over decades and the especial characteristics of asphalt, which make it a construction material easy to repair, allows a significant extension of its service life, when proper maintenance is done. Unfortunately, still nowadays, numerous Administrations prioritise the funding for new construction before the maintenance of the existing road assets, which in most cases lead in time to higher environmental impact and reconstruction costs.

When preventative and repair techniques are no longer effective, asphalt pavements reach the end of their service life. The international experience achieved for decades shows that asphalt is a material 100% re-usable in the construction and maintenance of new roads and 100% recyclable in other applications. Unfortunately, there are still historical misconceptions of “new” being better than “re-used” and the application of regulations (e.g. Waste Framework Directive) has led some countries not to facilitate the transition of site-won asphalt from “waste” category to “secondary raw material”. This is often translated into special operating procedures, which can reduce efficiency and increase costs.

Furthermore, while some Administrations do promote the circular economy, there is a risk of compromising the exceptional circularity that asphalt has by nature, through the use of by-products and waste materials from other sectors into asphalt.

For all these reasons, *the EAPA position is that, as long as it is technically and economically viable, a proper road maintenance must be carried out to maximise the service life of our road networks, prevent waste generation and minimise the depletion of new resources. After that, the re-use of existing asphalt shall always be the first option and its recycling the second. Therefore, there should be no intent (or requirement) to discard this valuable material. In other words, “asphalt” should never be considered as a “waste”. In addition, the asphalt industry must avoid the use of products, by-products and waste materials from other sectors, which may endanger asphalt fundamental properties, such as its own circularity.*

With the aim of helping stakeholders to achieve this and establish a better regulatory scenario, which maximises the circularity in the road sector, EAPA recommends the following actions:

1. *To stimulate demand for the use of sustainable solutions* in roads construction and maintenance, which optimise the criteria of sustainability, circular economy, eco-design and quality, through effective maintenance strategies and the use of reclaimed asphalt coming from existing pavements.
2. *To set up regulatory plans, in which “asphalt” is never considered as a “waste” by establishing reasonable end-of-waste criteria for site-won asphalt.* If the owner of the road is able to declare that the asphalt layers to be milled are not hazardous, the extracted material should be automatically declared as “by-product” or “secondary raw material”. Thus, its stockpiling and application should be permitted over the following years, in order to ensure that site-won asphalt is re-used into asphalt mixtures or, at least, recycled for other applications .
3. *To produce robust specifications designed to maximise circularity in the road sector.* Specifications must be designed to encourage the use of high RA contents in road construction and maintenance operations. They should also enable suppliers to prioritise the performance criteria of the mix design and/or the material characteristics.
4. *To prevent the introduction of waste materials and by-products from other industries, which could compromise fundamental characteristics.* Alternative components proposed to the asphalt industry must be only incorporated into asphalt if it can be demonstrated through a Risk Assessment process, that now and in the future, there will not be disadvantages with respect to circularity, health and safety, environmental impact, value for money, technical performance and competitiveness of asphalt solutions.
5. *To adequately manage asphalt with legacy materials.* Examples of these can be coal tar or asbestos. While such products are no longer used, they can still be found in old road pavements and seeking to re-use them requires

particularly special attention from start to finish from identification and assessment, to milling, transport, storage, disposal or mixing. Road owners have a fundamental Duty of Care in identifying the presence of potential contaminants in roads which they need to maintain, and therefore have a key role to play in ensuring that such wastes or any secondary materials, do not enter the re-using stream.

References

- [1] https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf
- [2] https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf
- [3] Cambridge Econometrics, Trinomics, and ICF (2018), Impacts of circular economy policies on the labour market.
- [4] Eurostat data for 2016.
- [5] <https://www.boverket.se/sv/byggande/hallbart-byggande-och-forvaltning/miljoindikatorer---aktuell-status/vaxthusgaser/>
- [6] Hertwich, E., Lifset, R., Pauliuk, S., Heeren, N., IRP, (2020), Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future
- [7] European Asphalt Pavement Association (EAPA). The Circular Economy of Asphalt. Technical Review (2021) 10 pages. <https://eapa.org/eapa-position-papers/>
- [8] [EAPA Asphalt in Figures 2019](#)
- [9] European Asphalt Pavement Association (EAPA). The use of secondary materials, by-products and waste in asphalt mixtures. Position Paper (2020) 10 pages. <https://eapa.org/eapa-position-papers>



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