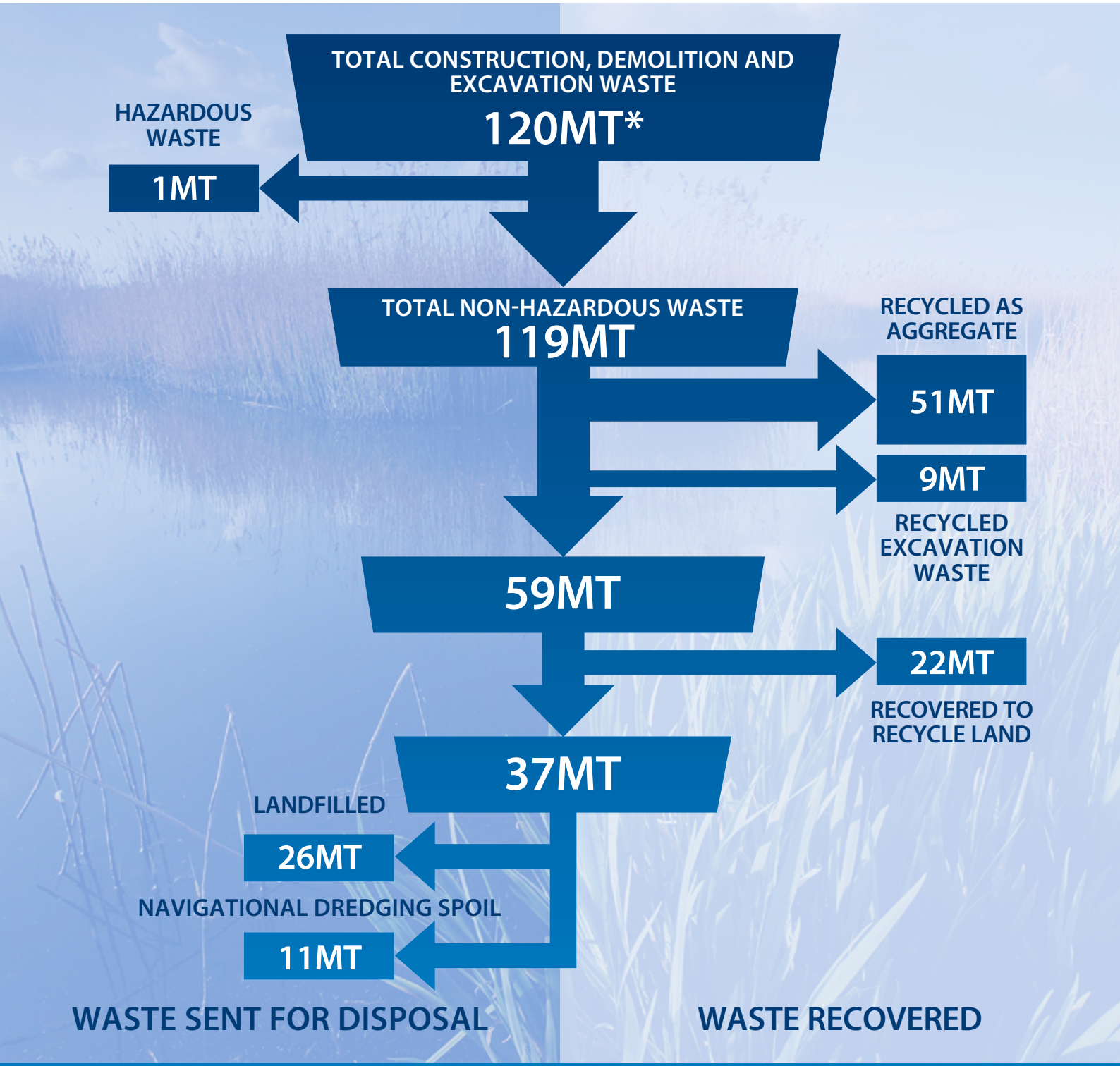
mpa
essential materials
sustainable solutions



From waste to resource

a UK Mineral Products industry success story

make the link
to mineral products

Overview

Introduction

The Mineral Products Association (MPA) is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries. The sector utilises waste materials across a wide range of the products in its portfolio, such as used tyres and secondary liquid fuels[4] being employed as fuel in cement kilns, to Construction and Demolition Waste (CDW) being re-processed into recycled aggregates for re-use. The restoration and recyling of land, by utilising suitable materials such as Excavation Waste (EW) post-extraction, is another activity contributing to the circularity and sustainability of the construction industry and supply chain.

Construction will often require demolition of existing buildings and structures built with hard and durable materials such as concrete and brick which, following demolition, can be recycled and re-used in new construction. Construction can also require excavation work such as groundworks and tunnelling which generate softer materials such as soils, sub-soils and clays which can be used for quarry restoration.

The Construction Sector Deal references that approximately 120MT[1] of Construction, Demolition and Excavation Waste (CDEW) from the construction industry was generated in 2014. Less well known is the work of the minerals and waste management industries to convert the vast majority of this waste into a resource in the 'chain of utility'. In reality, after discounting spoil from navigational dredging, much of which is disposed offshore, 76% of all construction waste is either recycled as aggregates or used in recovery operations, such as, the restoration of quarries and other mineral sites, enabling the recycling of land.

Indeed, UK activity and performance places it in the top tier in Europe with around 30% of all aggregate demand now supplied from non-primary sources, mainly recycled materials. In reality the scale of the construction waste challenge that we face is around 26MT, ie 78% lower than the headline figure of 120MT.

Against this backdrop, this document focuses on the use of EW by the mineral products sector as well as analysing the limitations to recycling and recovery.

KEY FACTS

120MT of Construction, Demolition and Excavation Waste (CDEW) is produced in the UK in a typical year, of which 12MT represents navigational dredging spoil disposed offshore and hazardous waste. From the remaining balance of 108MT:

- **76%** of all Construction, Demolition and Excavation Waste is currently recycled or recovered in the 'chain of utility' and directly contributes to the Circular Economy;
- **90%** of hard Construction & Demolition Waste (CDW) is recycled as aggregates[2]. Together with a further 9MT of recycled soft Excavation Waste (EW), this contributes **60MT** to the construction materials supply chain;
- **57%** of soft Excavation Waste (EW) is beneficially used, mainly in backfilling operations to restore land, often following mineral extraction;
- Only **26MT** of the remaining Construction, Demolition and Excavation Waste (CDEW) waste stream is actually sent for disposal, of which a proportion is likely to be used beneficially.

**The front cover demonstrates the Construction, Demolition and Excavation waste flows in the UK based on 2014 data[3]. Figures are rounded for illustrative purposes and waste end uses have been generalised.*

Construction, Demolition and Excavation Waste


Restoration to public spaces

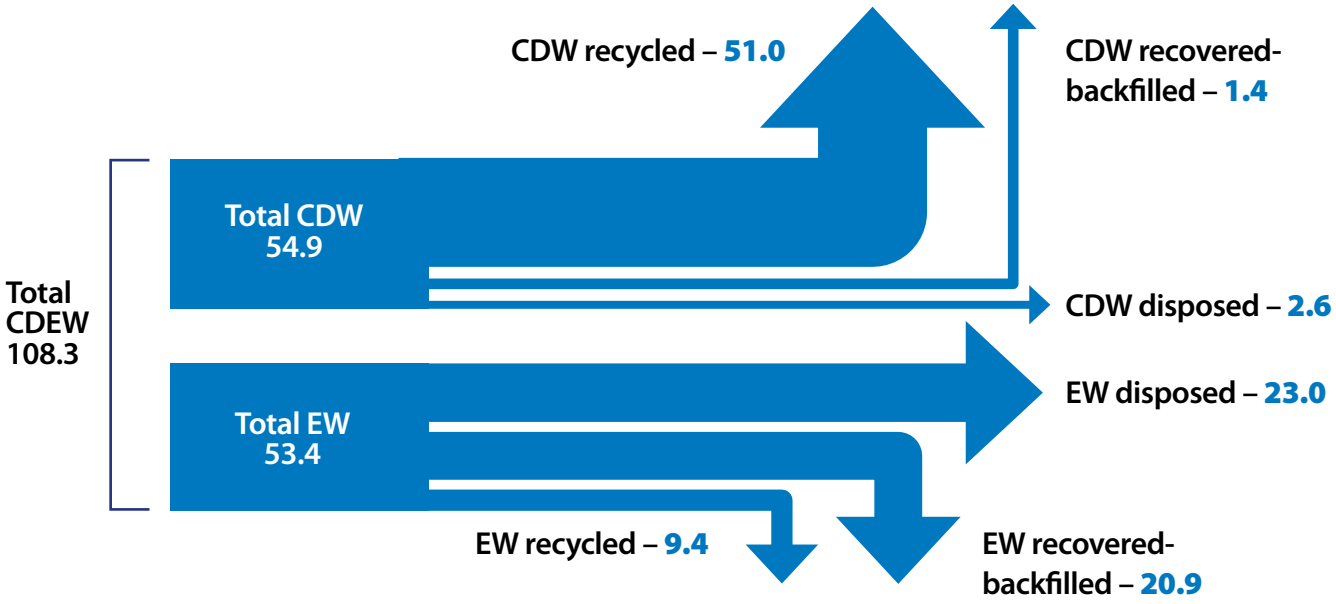


Diagram 1 - Recovery and disposal of CDEW in the UK, 2014[3] (figures presented in million tonnes, and exclude hazardous waste and navigational dredging spoil)

Background

The National Planning Policy Framework (NPPF) states that, "*It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation.*"[7]

Minerals and mineral products represent the largest material flow in the economy at around 1 million tonnes per day in a typical year and supply can not be assumed. The provision of mineral resources has to be planned, monitored and managed. The ability to secure permission to extract these essential minerals will be accompanied by a requirement to restore sites and recycle the land back to a suitable after-use once extraction operations have ended. The delivery of these restoration obligations will often require the use of suitable EW to reshape and profile the site.

Construction, Demolition and Excavation Waste

CDEW, at 120MT pa, is the largest waste stream in the UK economy. CDW constitutes the "hard" element of CDEW, typically containing waste types (based on European waste codes) that include concrete, bricks, tiles and ceramics, wood, glass and plastic and metal. The individual constituents that comprise CDEW ultimately influence the extent to which they can be recycled or recovered.

EW represents the "soft" element of CDEW, typically containing waste types (based on European waste codes) that include soils, stones and dredging spoil.

The availability of recent, quantifiable data on the CDEW waste stream is limited by the the absence of a transparent, national monitoring programme. The vast majority of CDW originates from demolition activity. As reported in 2009, approximate tonnages of demolition waste indicate that the highest tonnage of materials is concrete (59%), inert materials (21%) and metals (10%)[5].

Data on EW is also limited and based on estimates that were last revised in 2014[6].


Restoration to agriculture

Excavation Waste

Contribution of Excavation Waste

EW plays an important role in the delivery of quarry restoration. However, the absence of transparent, quantifiable data to evidence this role has led to a general misunderstanding that EW is often disposed of, rather than being recycled or recovered.

Due to the nature of EW, the recovery of this particular waste stream is more challenging than for CDW, as can be seen in Diagram 1. Despite this, 57% of all EW is currently being recovered. The minerals industry plays an important role utilising EW in quarry restoration and also the recycling of soils and clay materials. Furthermore, it is considered that opportunities for recovery and recycling could be increased if limitations were addressed.

Once separated from the CDEW waste stream, EW can be recycled into soils for use on the site of production, transferred to another site or as a product in its own right. MPA Members who produce recycled and secondary aggregates will, wherever possible, recover EW alongside these processes. As Diagram 1 illustrates, 17.5% of EW is currently recovered for other uses, excluding backfilling.

Restoration as a means of recycling land

One of the most significant end-uses of EW is in the phased restoration of mineral workings once extraction activities have ended. Mineral excavation is a temporary land use, with site restoration a critical element to ensure that land is available for future generations. In many cases, site restoration can result in the delivery of valuable new habitats, contributing towards national biodiversity targets and wider 'net gain' ambitions. Current, historic and restored mineral extraction sites host 700 Sites of Special Scientific Interest as well as 22 local nature reserves. Site restoration and land management has already delivered in excess of 8,000ha of UK priority habitats and the industry is uniquely placed to deliver more, with at least a further 11,000ha committed to in restoration plans. In many cases, the restoration work will contribute towards the delivery of positive biodiversity and nature conservation outcomes. Examples of these are reflected in the MPA and Natural England bi-annual Biodiversity Awards and MPA Biodiversity Strategy[8].

Planning conditions will require sites to be restored to beneficial after use which can include agriculture or even housing development. Restoration of sand and gravel sites, as well as some hard rock sites, is often reliant on the availability of suitable materials, such as EW, to re-contour and re-design the restored landscape. The use of EW can also help realise new recreational uses.

Defra data, presented in Diagram 1, indicates that 39.3% of all EW is currently recovered for use as backfill. Recovery activities, such as backfilling, can be considered as any operation that involves substituting non-waste materials with a suitable waste for reclamation or engineering in landscape works[9]. Whilst not all backfilling operations will be associated with quarry restoration, a large proportion of this activity can be attributed to these applications. Consequently, the mineral products sector represents a significant end-user of EW, activity which generates substantial benefits by returning land previously subject to mineral extraction back to beneficial and productive use.

Restoration to nature

Limitations on use

In order to better understand the recovery and recycling of EW, it is necessary to improve our understanding of the wider CDEW waste stream through more robust and consistent data recording. This would allow limitations to recovery to be better identified and resolved, which in turn would then allow the rates of recycling and recovery to be improved.

The following areas will need to be addressed to further develop understanding of the EW waste stream:

- **Classification on site: waste or non-waste** - At the site of origin some material, such as soils, may be diverted away from the waste stream under schemes such as the CL:AIRE Definition of Waste: Code of Practice[10]. This may influence the year-on-year metrics used to define 'waste' totals, as different schemes will divert material away from the recorded waste stream. This may result in inconsistent data from year to year.
- **Changes in definitions of contaminated soils** - Some EW will exhibit hazardous properties and, therefore, must be classified and disposed of appropriately rather than being available for re-use. For example, recent changes to the Environment Agency issued guidance, Technical Guidance WM3: Classification and assessment of waste[11] may impact on the amount of EW that is ultimately available for recovery as opposed to requiring disposal.
- **Regulation and permitting** - Changes to permitting regulations will be influenced by case law interpretation. These will mean that the precise nature and quantities of waste recorded, along with their destination, are likely to vary year-on-year. As an example of this, a case won by appeal[12] in 2015 has fundamentally changed the way in which 'deposit for recovery' permits are determined. Revisions resulting from case law can therefore influence the wider waste stream that is reported each year, whether in terms of the total tonnages that are generated or their final end-use.
- **Direct barriers** - There are a number of direct barriers that can constrain recovery and recycling. By understanding and addressing these, recycling and recovery could be further improved. An example of this is the permitting and classification of soil products that are generated by screening CDEW. The permitting requirements for such activities can be complex, and the time, effort and costs involved may prove a barrier and prevent some EW recycling operations realising their potential. It can be more straightforward to simply dispose of EW materials to landfill. This can be compounded by the variability of the incoming waste, as a high percentage of silt will make it uneconomic to recycle. Costs are also an issue, as the complexity of EW recycling requires more substantial capital investment compared to the cost of processing plants for hard CDW.

Conclusion

CDEW at 120MT pa, is the largest waste stream in the UK economy. However, once hazardous waste and navigational dredging spoil is excluded, 76% of CDEW is currently being recovered and recycled for alternative uses, reducing the net waste requiring disposal to landfill to 26MT pa. This level of re-use is significantly higher than other waste streams[14] such as waste from households, packaging waste and waste from commercial and industrial activities.

90% of 'hard' CDW is recycled or recovered, suggesting a high level of efficiency in realising value from these wastes. The equivalent rate for the 'soft' EW is currently around 57%.

This represents a notable achievement; however, there remain some opportunities to improve the value that can be realised from EW.

General statements of the scale of CDEW waste mask weaknesses in understanding of the composition of the total waste stream. Overall, these perceptions are simplifying what is ultimately a complex situation.

The assumption that vast quantities of waste are not used beneficially is misleading, and underestimates the high degree of resource recovery taking place in the UK.

More consistent and comprehensive data collection and monitoring of waste arisings and resource use is long overdue and the absence of robust data is fuelling misconceptions about the positive achievement being made by the mineral and waste industries to use waste as a resource and, in turn, contribute to the Circular Economy.

1 *HM Government Industrial Strategy- Construction Sector Deal (2018) pg23*

2 *DEFRA Government Statistical Service UK Statistics on Waste (2018) pg7*

3 *DEFRA Statistical data set- ENV23- UK statistics on waste (2018)*

4 *MPA Cement Fact Sheet 7 Alternative fuels and raw materials in cement kilns: cement quality and concrete performance (2015)*

5 *CRWP Overview of demolition waste in the UK (2009) pg2*

6 *DEFRA Statistical data set- ENV23- UK statistics on waste (2018)*

7 *Ministry of Housing, Communities & Local Government, National Planning Policy Framework para 203*

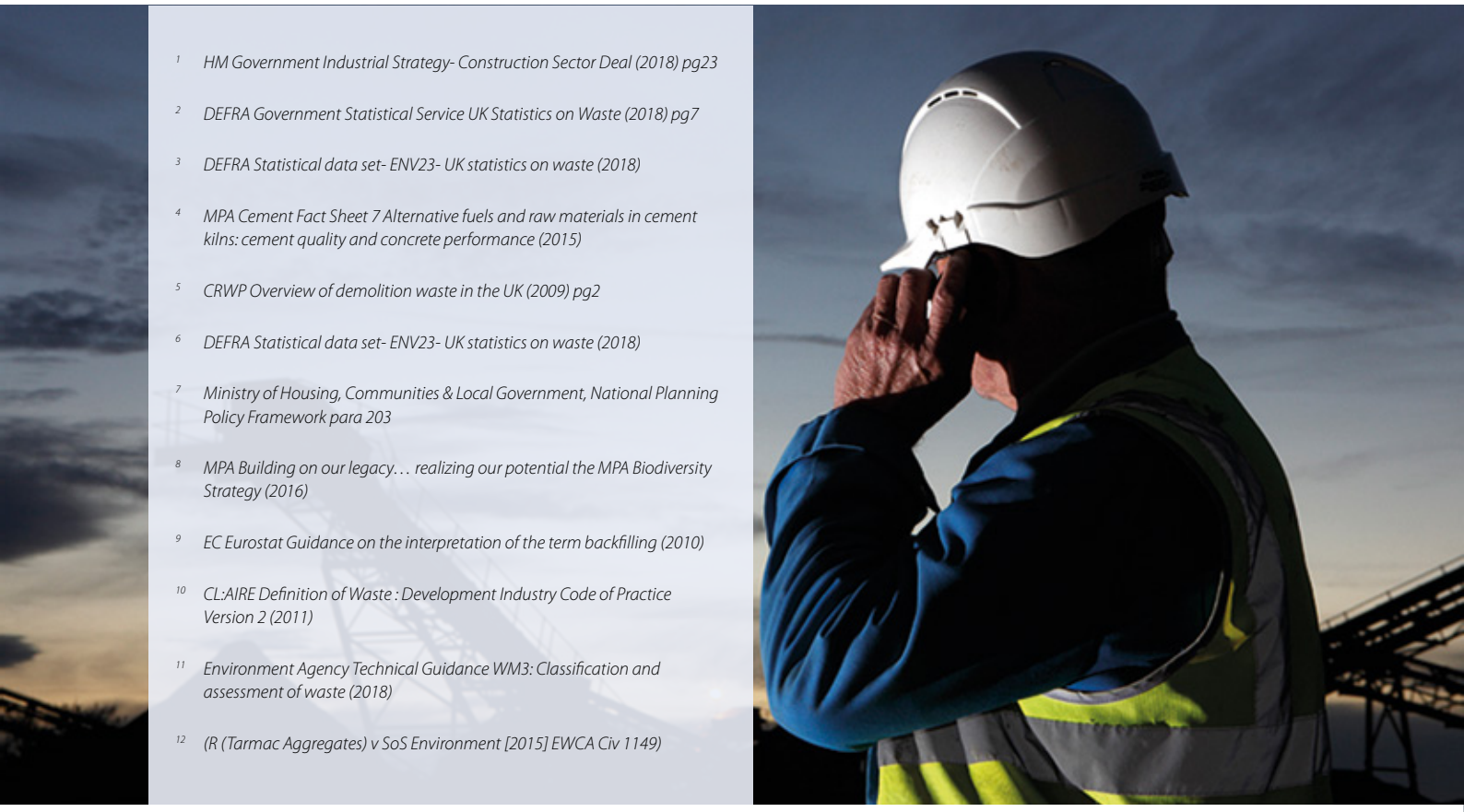
8 *MPA Building on our legacy… realizing our potential the MPA Biodiversity Strategy (2016)*

9 *EC Eurostat Guidance on the interpretation of the term backfilling (2010)*

10 *CL:AIRE Definition of Waste : Development Industry Code of Practice Version 2 (2011)*

11 *Environment Agency Technical Guidance WM3: Classification and assessment of waste (2018)*

12 *(R (Tarmac Aggregates) v SoS Environment [2015] EWCA Civ 1149)*



The mineral products and quarrying industry contribution to the UK:

390mt
GB production of aggregates and manufactured mineral products

£6.8bn
Gross value added of our industry

£152bn
Value of construction, our main customer

£18bn
Annual turnover

£513bn
Turnover of industries we supply

74,000
People directly employed in our industry

3.5m
Jobs supported through our supply chain

The Mineral Products Association is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries.

For further MPA information visit www.mineralproducts.org

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