

Brexit – Effects on European Waste Management

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On January 17, 2017, Theresa May, the UK Prime Minister outlined a twelve-point Brexit plan. The European Union (Notification of Withdrawal) Bill was introduced to the House of Commons on January 26, 2017 and was made an Act of Parliament on March 16, 2017. The Department for Exiting the European Union released a White Paper, *The United Kingdom's exit from and new partnership with the European Union* on February 2, 2017. The point at which the UK leaves the EU, all EU legislation which has not already been transposed into UK law will be transferred to UK statute. From then on, that legislation will remain in force as part of UK law, although it can be repealed or amended by the UK Parliament. On March 29, 2017, the UK government triggered Article 50 of the Lisbon Treaty 2009. On June 8, 2017, a snap election was held, resulting in a significantly changed political landscape in the UK.

2017 has been a busy year, with some key political events occurring in the first six months. I started thinking about this paper in late May, and have already had to change my perspectives several times over. It is then perhaps worth noting here at the start, this paper has been prepared on the basis that Brexit happens; it may yet fail and the UK remain within the EU ... an outcome I would be very happy with.

Europe, its people, and its waste management, is a complex mix. Whilst the title of the paper is to consider the impact of Brexit on European waste management, I have focussed on UK generated residual waste, and notably its export for recovery. This is for the simple reason that we are the ones leaving and yet we are significantly reliant on facilities in mainland Europe to sustainably manage our residual waste. Brexit must impact the UK more directly as the rest of mainland Europe carries on managing its waste quite happily without us.

The impact of Brexit on the economy is clear, and already recognised to have had a more significant effect than even the global financial crisis of 2008/09 and subsequent Eurozone crises (Figure 1). From my own perspective, and discourse with industry leaders, there is both an economic and emotional effect of Brexit yet fully to be understood.

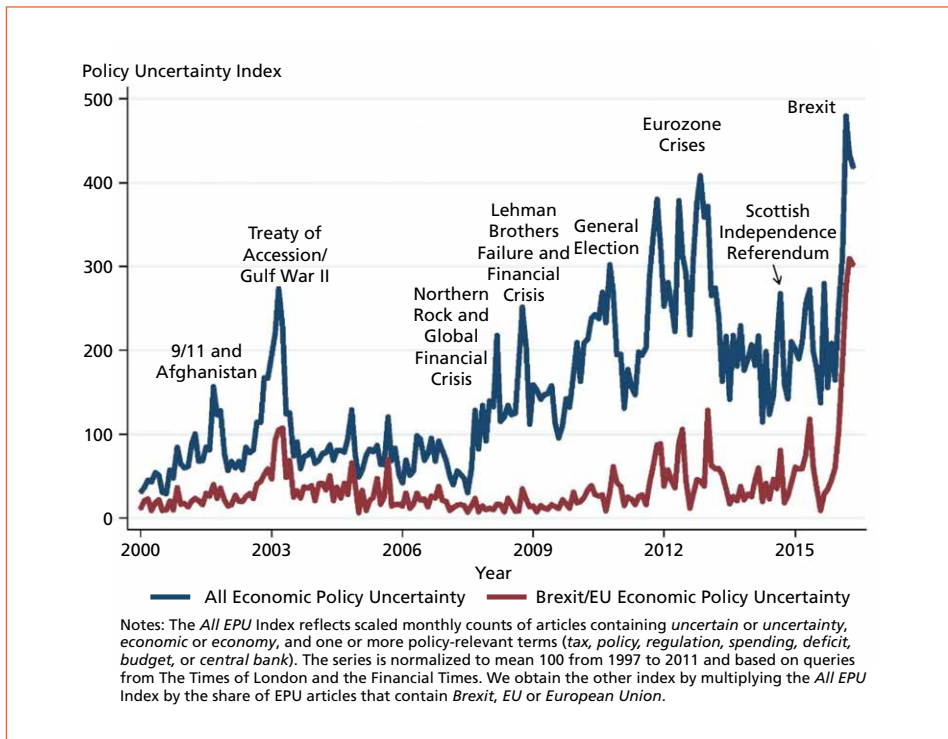


Figure 1: United Kingdom Economic Policy Uncertainty: All and Brexit/EU

Source: http://www.policyuncertainty.com/uk_daily.html

1. Residual waste recovery

1.1. Current export from the UK

Residual waste, refuse derived fuel (RDF), waste derived fuel (WDF), secondary recovered fuel (SRF), hybrid fuel ... there are many terms used to describe the discarded materials that are treated by incineration to recover power, and hopefully heat. I prefer, and

in this paper will use, *residual waste*. It is a simple enough term, and seems to me to be the most honest; it is the waste remaining after recycling that should be diverted from landfill and from which benefit can be gained through recovery capacity (in this paper I use this term to mean incineration with heat and power off-take).

Some three million tonnes of residual waste is exported from the UK to mainland Europe, just under two percent of all waste generated in the UK. What is astonishing is the rate at which such practice has grown: from nothing in the early 2000s; to about 900,000 tonnes in 2014; to potentially 3.5 million tonnes in 2017. Once explained as a temporary measure to get over the capacity gap (like when you are waiting for the spring fruit and vegetables to harvest) export is now firmly established as an accepted management method; mainland European facilities make a significant contribution to the mix of residual waste treatment capacity used by the UK.

3.5 million tonnes is comparable to four plant the size of the Runcorn Facility, in Greater Manchester: the combined two elements of which (at 850,000 tonnes per annum) constitute one of the largest energy from waste plant in Europe; built (in large part) to deliver sustainable treatment of residual wastes from one of the largest public contracts in Europe. 3.5 million tonnes is comparable to three plant the combined size of Ferrybridge Multifuel 1 and 2 (at Knottingley, West Yorkshire) probably the largest, wholly merchant, residual waste treatment capacity provided in the UK (combined nominal capacity of 1.1 million tonnes per annum). This is a massive amount of residual waste.

Bearing in mind the cost (300 GBP million plus) and the time (a minimum of five years) it would take just to gain planning consent for such plant, the UK's reliance on export is likely to continue. If this practice ceased, we would have a massive shortfall in capacity; and this is just one element of the UK capacity gap.

1.2. Future export from the UK

As a member of the EU, the UK can readily export residual waste to the continental mainland. The Transfrontier Shipment of Waste Regulations 2007 implement the rules on waste transfers established by EC Regulation No. 1013/2006, ensuring common notification processes for shipments across Europe. Until Brexit is confirmed, the UK must continue to comply with current legislation and EU Directives. Each of the devolved governments within the UK has established policy for waste management and is making progress towards achieving these.

I believe it is consequently unlikely that the UK will significantly change its waste regulations; I do not foresee this being a material effect of Brexit. From a democratic legitimacy standpoint, I see no reason why the EU legislation implemented so far need stop being British law, for the simple reason that they were laws approved with the active participation of the British government in negotiations and the British members of the European Parliament. From a commercial standpoint, the legislation is generally well understood and implemented by business across the board, and there would be seem to be little interest from government to make significant change. Looking forward, I would predict that our policies will remain aligned, in principle at least.

Far from being a stop-gap solution, I would forecast that, even with Brexit, the UK's demand for recovery capacity on mainland Europe will continue. There are new domestic projects in the pipeline, but not sufficient to deliver 3.5 million tonnes. In addition to which there is: a residual waste treatment capacity gap of at least some five million tonnes; and in the order of one million tonnes of capacity that is not working, facilities that involve some combination of mechanical biological treatments, advanced thermal treatments, etc that are just not delivering. I do not dispute that such technologies have a role to play in managing waste, but there is a recognised need to replace those plant that are not providing effective or efficient residual waste treatment. So, we have the best part of ten million tonnes per annum of residual waste requiring diversion from landfill, before any potential for waste growth is considered.

In the UK there is a significant level of change occurring with public authority contracts, in both large and small, rural and urban administrations. Remember the Greater Manchester waste management contract mentioned earlier in this paper? In May 2017, the contracting authority announced that it was terminating the contract, seventeen years before it is due to expire.

Brexit has almost certainly had a role in prompting this change, most directly through the devalued Pound compounding central government austerity measures and forcing a review of local authority spend. Municipal waste is a small proportion of all waste generated in the UK (about a quarter) but it is important to this paper in two ways: it generally has a suitable composition for recovery capacity; and local authority contracts are an important financial element to funding new facilities. Without that public sector investment, it becomes increasingly difficult to build new plant that can also sustainably manage wastes generated by the private sector.

In addition to all the above, there is a programme of landfill closure happening within the UK. Already there are significant regional differences in terms of landfill void availability, with some waste moving substantial distances to reach an appropriate disposal point. This is starting to drive an increase in the disposal cost per tonne, landfill is the only waste management service to show an increase in gate fees in 2016 [12]; landfill facilities can once again make a profit.

If new capacity is not created within the UK then to avoid disposal to landfill the end destination must be continued reliance on recovery capacity in mainland Europe.

1.3. Demand from mainland Europe

There is then potential for the demand from within the UK to increase, alongside an increase of demand on the same capacity from within mainland Europe. Figure 2 provides an indication of residual waste arisings and treatment capacity in the EU. Whilst some countries do have spare capacity (Belgium, Denmark, Netherlands, and Sweden) there is not an excess available; indeed there is indicated a roughly fifty million tonnes per annum shortfall (including 6.5 million tonnes in the UK).

As new nations join the EU and become subject to the requirements of the Waste Framework Directive, so I would expect competition for recovery capacity to grow. The squeeze on public and private finance is not limited to the UK, and if existing capacity exists just down the road, then why not use it.

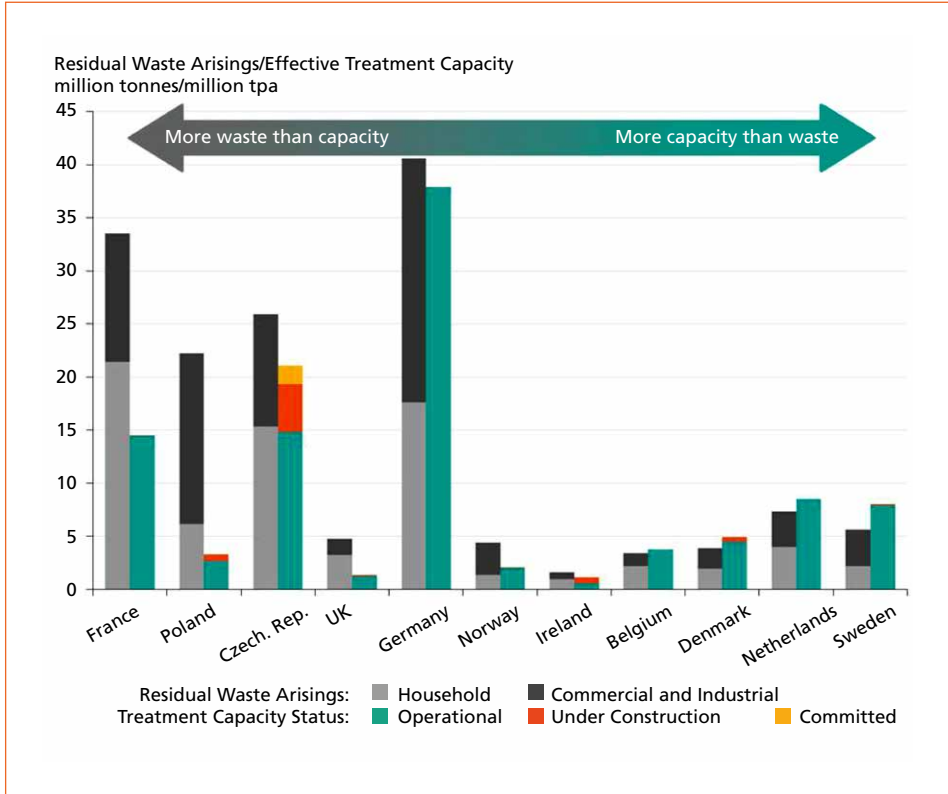


Figure 2¹: Residual waste arisings and treatment capacity

Waste is already seen to move from east to west for treatment within mainland Europe and this increased demand for recovery capacity will impact upon UK exports. There is potential for waste growth within mainland Europe: real growth in tonnage terms; but also residual waste growth as active management increases and residual waste is diverted from landfill, consequently requiring recovery capacity. This change is happening alongside Brexit, and would happen anyway, but Brexit can still have an effect.

¹ Residual Waste Infrastructure Review, Issue 11, Eunomia, December 2016. Hendeca has not rigorously reviewed the original data or method used to compile this graphic, but it is considered to provide a reasonable indication of residual waste treatment demand and capacity, suitable for the purposes of illustration

2. The Brexit effect

2.1. Trade

Current UK processing costs for preparing residual waste for export are not dissimilar to preparing it for domestic treatment. However, the logistics necessary for export incurs additional handling and transport costs (actual and legislative) estimated by some to be sixty percent of the total cost. Recent devaluation of the Pound (hitting a thirty year low) is already making export more expensive per tonne. The continued uncertainty, decreased linkages between the Pound and the Euro, and the disaggregation of the UK and European economies may yet see this situation worsen.

Currently traded without tariffs, or any other trade barrier, the basic gate fee per tonne of waste should be on a level playing field. Operating outside of the EU, trading as a *most favoured nation*, Brexit could mean the UK having to pay both VAT (20 percent being a general standard rate) and a 6.5 percent duty on each tonne exported to the EU. Brexit could add nearly 30 percent to a gate fee that may be increased through mainland competition; this has the potential to result in a cost that makes development in the UK seem attractive once more.

2.2. Human resources

Industry sources indicate that the UK's residual waste export habit will continue, but might be expected to decline over time as new domestic capacity is delivered. New investment in the UK waste industry is to be welcomed, on many fronts, but Brexit has the ability to negatively affect the successful design, construction and operation of new waste management capacity.

The minerals industry currently employs significant numbers of EU citizens, on average 3 percent of the industry's workforce come from the EU, increasing to 9 percent for activities directly related to freight transport by road.[2] It is not unreasonable to assume a similar percentage within the waste industry, it may even be more. The point is, there is currently no guarantee that EU citizens now resident in the UK will have a continuing right to reside in, and work in, the UK following Brexit. Nor is there clarity over the arrangements for mainland EU nationals to work in the UK in the future.

In the UK we have a skills shortage of those trades relevant to the design, build and operation of new plant: engineers; project managers; electricians etc. This uncertainty needs early resolution, not just for our fellow Europeans who are directly affected, but also for the success of the waste industry.

The top five waste management companies operating in the UK (based on 2015/16 revenues [5]) are: Veolia Environmental Services; Biffa Group; Suez Environnement; Viridor Waste Management (Pennon Group); and FCC Environment. Three of these companies have their group headquarters in mainland Europe (France and Spain). Growth opportunities across other continents may simply be more attractive.

2.3. The Circular Economy

The current EU target is for at least fifty percent of household waste to be recycled by 2020. The UK still has some work to do to meet this target; recycling of waste from households was 44.3 percent in 2015, falling from 44.9 percent in 2014. This is the first time the rate has fallen since 2010, although the 2015 figure still represents the second highest annual value on record.[11] Making a small change to the English monitoring protocol, such that metals and ash recovered post-incineration would contribute to recycling targets (an approach already implemented in some countries including Germany and Wales) would increase recycling achievement by some 5 percent; a material increase for an (arguably) insignificant change to policy.

Recycling and recovery targets are still to be set for the period beyond 2020. However, current EU proposals include recycling rates of 60 percent by 2025 and 65 percent by 2030, with a gradual limitation on landfilling of municipal waste, to 10 percent by 2030. Implementation of the Circular Economy is seen as the route to achieving these targets.

It is debatable whether adoption of the EU Circular Economy package will be achieved prior to the conclusion on Brexit negotiations; if Brexit takes effect first, then I do not foresee the UK as a whole signing up to these targets, although the devolved administrations of Scotland and Wales are moving in that direction. Certainly Scotland is currently a leading light, awarded the AB InBev Award for Circular Economy Governments, Cities and Regions in January 2017. [1]

However, there is potential, although I think it is a stretch, for the situation to be very different across the remaining members of the EU. The Circular Economy could be rolled out with great success across mainland Europe, reducing waste generated, achieving (exceeding?) the increased recycling targets, and consequently dramatically decreasing the amount of residual waste for recovery. This would leave mainland European, operational, recovery capacity available for the UK's residual waste; potentially at a reduced gate fee reflecting this drop in demand.

Reference to the Circular Economy leads me to consider a separate matter, just briefly... joint working across Europe. This is something I sincerely hope will continue even with Brexit, although the signs are already looking gloomy. In 2016, in a confidential survey of the UK's Russell Group universities, The Guardian newspaper found cases of British academics being asked to leave EU-funded projects or to step down from leadership roles because they are considered a financial liability [7]. Brexit could make it very difficult for WRAP² to continue taking a lead role in EU-funded projects.

And yet ... our similar problems can share common solutions; an approach demonstrated across pan-European Circular Economy initiatives. Kick-starting the Circular Economy, the European Clothing Action Plan is the first EU-Life funded project to drive sustainability throughout the entire lifecycle of clothing. [13]

² Waste and Resources Action Programme. <http://www.wrap.org.uk/>

The Circulars, are self-described as the world's premier Circular Economy award program, but importantly they are a global initiative of the World Economic Forum, the Forum of Young Global Leaders, and Accenture Strategy. Europe, organisations from which performed well in the 2017 awards, is making its mark on waste management globally. The UK should want to remain a part of this whether in or out of the EU.

3. Put into perspective Factors beyond Brexit

3.1. Global factors

Whilst Brexit has undoubtedly already had an impact, and we could yet see much greater effect, it is not the only show in town.

Over a bid dialogue period of eighteen months, when an element of my client's solution was to export residual waste to mainland Europe for a defined period prior to the proposed UK plant becoming operational, factors around shipping costs and availability changed dramatically. They shifted from being a cost-effective, reliable and flexible service, to simply having no capacity at all due to the growth in other shipment demand. Asia's, particularly China's, increased scrutiny of the material it receives has the potential to drive global change in shipping cost and availability.

The impact from a freak weather event in Japan had a causal effect, prompting Germany's government to reverse its energy policy and require all its nuclear power plant to be closed out by 2022. This prompted E.On to review its asset base, resulting in the sale of a majority stake of its energy from waste business. I believe this random, and global, chain of events effectively stopped new recovery capacity being delivered in the UK by E.On.

Holiday reading of the New Yorker led me to an article identifying a global aggregates crisis; the availability of the resources (materials and manpower) required to build new plant is limited. Aggregate is the world's second most heavily exploited natural resource, after water, and for many uses the right kind is scarce or inaccessible. In 2014, the United Nations Environment Programme published a report titled *Sand, Rarer Than One Thinks*, which concluded that the mining of sand and gravel *greatly exceeds natural renewal rates* and that *the amount being mined is increasing exponentially, mainly as a result of rapid economic growth in Asia*. [10]

Part of the reason is very specific composition requirements (think bespoke sand created for volleyball competitions staged one hundred metres from a beach ... a potential new use for incinerator bottom ash perhaps?) but also the appetite for construction in growth nations. Pascal Peduzzi, a Swiss scientist and the director of one of the U.N.'s environmental groups, told the BBC in May 2016 that China's swift development had consumed more sand in the previous four years than the United States used in the past century. In India, commercially useful sand is now so scarce that markets for it are dominated by sand mafias.

3.2. Domestic factors

The reported change in landfill economics could be an interesting domestic dimension. If landfill void becomes profitable again, then the current programme of site closure may be halted and some sites may even re-open. This capacity provides an appropriate home for residual waste, if not a preferred destination. This maintained capacity can consequently continue to release the pressure on/demand for recovery capacity and so affect development of new treatment facilities.

Likely to be of greater significance is the Climate Change Act 2008 committing the UK to reduce greenhouse gas (GHG) emissions by at least eighty percent of 1990 levels by 2050.

Progress to date has been pretty good; emissions were 38 percent below 1990 levels in 2015. The first carbon budget was met and we are currently on track to outperform on the second (2013 to 2017) and third (2018 to 2022) carbon budgets. However, the easy wins having been made, forecasts currently predict the fourth carbon budget (2023 to 2027) will not be met; without change the fifth (2028 to 2032) will also be unattainable. The Climate Change Act is domestic law, and consequently is required to be achieved regardless of Brexit. To meet future carbon budgets, and ultimately the 2050 target, the UK will need to reduce GHG emissions by at least three percent each year. [6]

Since 1990, waste GHG emissions have fallen by 73 percent. Reflecting real change in UK waste management practices, waste GHG emissions fell by eleven percent in 2014, following an annual average twelve percent decrease over the period 2009 to 2013. These reductions have principally been achieved through: reduction in biological waste deposited in landfill; investment in methane capture technology; and improved landfill site management. Waste emissions currently account for about four percent of total UK GHG, and remain predominantly methane emissions from the decomposition of biodegradable waste in landfill. [8]

The advice of the Committee on Climate Change in regard to further reducing waste GHG emissions is for more stringent policy, including separate food waste collection and reduced biodegradable waste to landfill. WRAP estimates some ten million tonnes of food waste generated annually (from UK households, hospitality and food service, food manufacture, retail and wholesale sectors) sixty percent of which could have been avoided. This waste stream has a value of over seventeen GBP billion a year, and is associated with around twenty million tonnes of GHG emissions. [3]

Industry sources also identify the prevention of plastics/fossil-fuel based products being treated through recovery capacity and/or a requirement for all incineration plant to recover heat as well as power; a policy already implemented in Scotland. Developing gases from anaerobic digestion for standard use within transport would be another significant change. These shifts in policy would mean future UK waste management infrastructure could look quite different to that seen previously, but this change would be driven by domestic legislation rather than Brexit.

4. Where do we go from here?

Where do we go from here? That, of course, is the million dollar/pound/euro question; and knowing the answer, across more than just waste management, would make a lot of people very happy. In the absence of any certainty, I set out my vision for the future of European waste management.

First, that the UK does not leave the EU. Second, that the EU (including the UK) remains at the forefront of waste management, leading global best practice and celebrating it widely.

In relation to UK residual waste, much as I am a Europhile, I see this as a resource that we should be optimising at home. Within the UK we have a combination of: a massive amount of residual wastes that need to be managed sustainably; buildings operating inefficiently; and a power crisis. The answer seems pretty obvious to me. Not only would an increase in energy recovery (whether via incineration or biological technology) make a positive contribution to solving all these problems, it would also: bring inward investment and jobs; boost supply chains; and sustain the UK as an innovator and technology developer. Our cities are evolving in response to new global conditions [9], and I believe that our waste management infrastructure should do so too.

Millenials, those born after 1980, now make up the largest age group in the world population. This generation is important because by 2025 Millenials will make up 75 percent of the workforce; and they have known nothing but the digital age. In the UK, Millenials already make up about a third of the workforce; their ambitions are already being felt on the political stage, and this generation will soon be shaping our built environment too.

A digital age has the potential to change how we structure our cities, moving from large scale, late 20th Century, institutional funding of big projects with sequential investment (serial land ownership, segregation of infrastructure and land development) to a more human relevant city. The next phase of city development can take us to a different funding model, including long-term land ownership and stewardship. Increased urbanisation can help deliver district heat programmes and enable separated food waste collection. Critically, in my vision, infrastructure is integrated; it underpins the delivery of creative, vibrant, mixed-use places.

This sounds quite a utopia, but I do not mean to propose a bucolic idyll. Larger scale recovery plant, with all their economic and operational efficiencies, are fine by me if they are well designed and properly integrated with the communities around them. It is difficult to argue against the fact that within the UK there is a market for both heat (and cooling) and power – not least through another example of the digital age, the growth in data storage centres. Efficient heating/cooling systems and sustainable power supplies, underpin cost-effective homes and profitable business.

Whilst it is not currently on the agenda, there can yet be a post-Brexit political desire to retain the value from waste within the UK, using this resource to stimulate inward investment and growth in GDP, create jobs, and make a domestic contribution to

solving the energy crisis. Put simply, I would like to see more recovery capacity in the UK, delivered as part of an effective network of European waste management facilities. If Brexit can be used to bring this success, then I can be persuaded to see one silver lining.

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