

Designing for a changing feedstock supply

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Given current and expected market trends, there are a number of factors which will influence the optimal size of a RWTF. The risks, notwithstanding the benefits within a PFI of a guaranteed minimum tonnage (and revenue), associated with an inappropriately sized RWTF have the potential to be both commercially and technically significant. For the developers and funders of merchant RWTFs, with no or little guaranteed income, these risks are materially greater and such projects face a real challenge in the current markets if they are to successfully raise project finance.

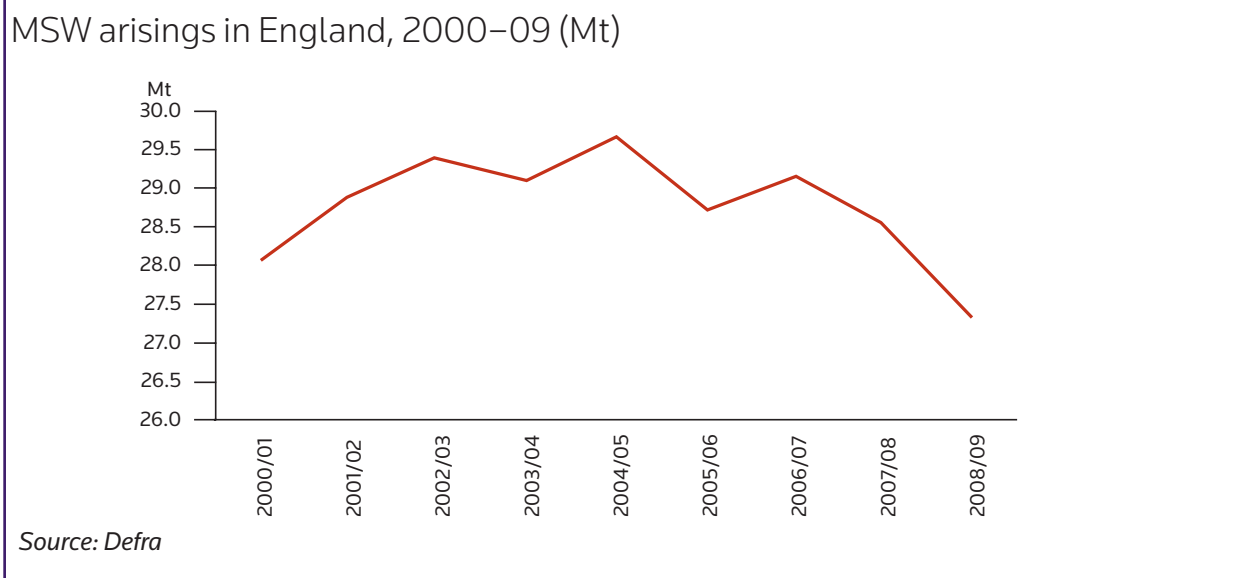
The waste PFI market has developed significantly over the past 10 years. For the early 'integrated' projects (involving a range of facilities and sometimes even waste collection) the expectation was that, notwithstanding waste minimisation efforts, municipal waste (MSW) tonnages would continue to rise and that recycling targets (of c.30–35%) would be difficult to achieve. For bidders the emphasis was on 'predict and provide,' i.e., with a key objective to ensure that project infrastructure was of sufficient capacity to last 25 years.

In many of these early projects, contractor responsibility included the processing of materials separately collected at the kerbside for composting or recycling as well as the black bag ('residual') waste which remained. Even if a seemingly improbable surge in recycling was modelled, the total tonnage of waste to be managed was unlikely to reduce and so for these projects, careful calibration of the payment mechanism could address volume risk to the satisfaction of both sponsors and funders.

The changing structure of waste PFI projects

The Kelly Report in 2006 identified the need to increase capacity and competition in the expanding waste PFI market. Within a relatively short period, the structure of waste PFI projects shifted fundamentally, with the focus upon the provision of the capially intense residual waste treatment facilities (RWTFs) and local authorities encouraged to separately procure ancillary contracts for recycling, composting and landfill disposal.

Figure 7.1



This move towards RWTs coincided with the first evidence of a more permanent change in the pattern of MSW arisings. Over the previous five years there had been signs that growth was slowing from the 3% p.a. seen in the early 2000s (see Figure 7.1), but by 2006/07 the combined effects of legislation, public education and improvements in collection infrastructure were leading to reduced MSW arisings. Over the last 18 months the recession, with lower levels of household consumption and changing demographics, has put still further downward pressure on MSW tonnages. Over the same period, there has been a significant improvement in MSW recycling figures to levels which to many observers seemed impossible just 10 years ago. In England (the other devolved regions show a broadly similar trends) the MSW recycling rate has risen 3% p.a. since 2002/03 and it appears to be on course (just) to meet the Waste Strategy 2007 target of 40% recycling by 2010 (see Figure 7.2).

Figure 7.2

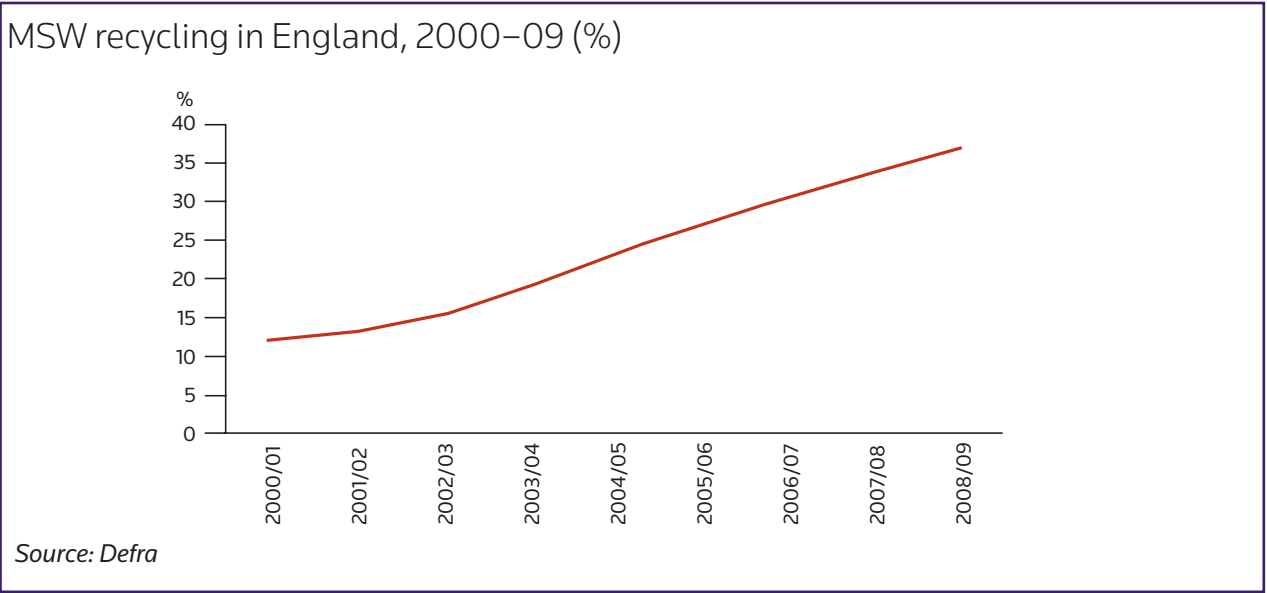
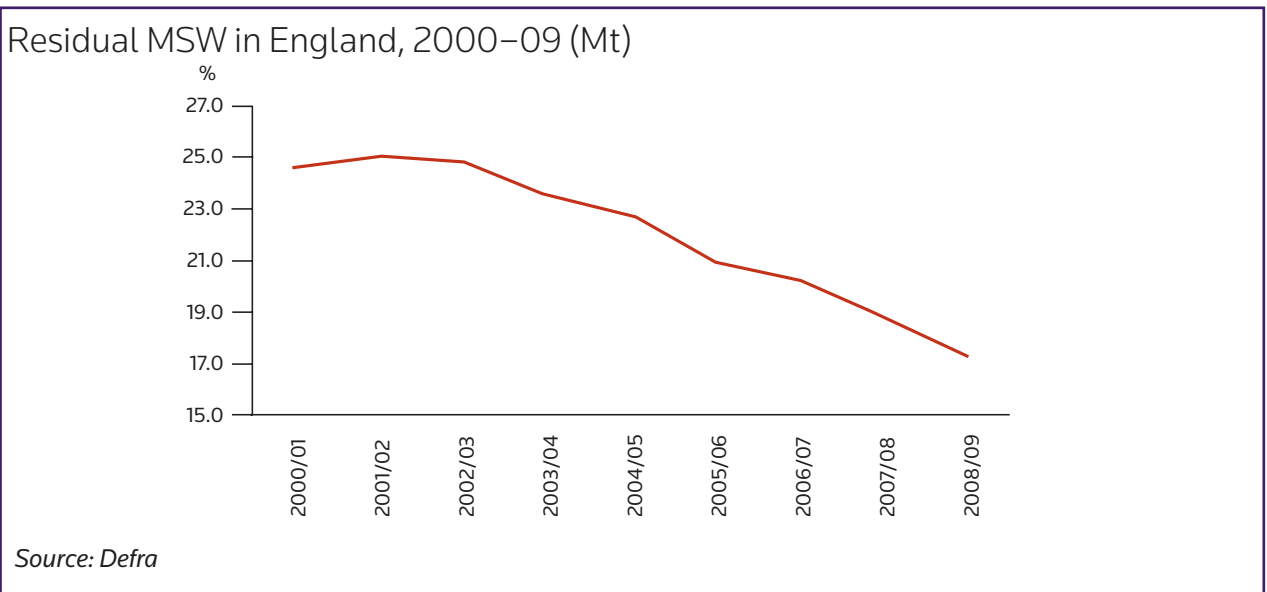


Figure 7.3



RWTFs, treating as they do the waste remaining after recycling, are 'end of pipe' solutions. The compound effect on the tonnages of residual waste requiring treatment in RWTFs from the reduction in MSW and rising recycling rates has been very significant (see Figure 7.3), with an average annual decline of 5.8% over the last seven years.

Contractual implications

For PFI bidders looking to deliver new RWTF infrastructure, such trends would represent a fundamental challenge to bankability without some form of contractual protection. In the old 'integrated' PFIs, with their exclusivity to waste, 'minimum tonnage guarantees' were largely hidden within the workings of the payment mechanism, and in the early post-Kelly projects minimum tonnage guarantees were often not described as such. However, minimum tonnage guarantees have had to become more explicit of late.

At one level, the willingness of the public sector to accept this development is somewhat surprising. What is the danger, for example, that minimum tonnage guarantees will provide opponents of RWTFs with the ammunition to argue that a RWTF will only serve to 'crowd out' recycling and composting? It would be highly undesirable if this trend were to increase planning risk, given that 73% of respondents to a recent survey (Norton Rose: The Future of Waste PFI Three Years on – September 2009) already identified this as the main barrier to a successful PFI project (see further Chapter 10).

For local authorities, a guaranteed minimum tonnage, particularly if incorrectly set, has the potential to transfer significant risk to the public sector. Defra has therefore been keen to push back as much of this as possible such that, should residual MSW tonnages fall below the guaranteed minimum for whatever reason, the contractor is under some form of an obligation to find alternative sources of (merchant) waste. Defra's latest public position originally contained in the Consultation Draft of the WIDP Residual Waste Treatment Contract and reconfirmed in a note of December 2009, highlights proposed contractor obligations with respect to finding 'substitute waste'. For some, this approach is seen as having the potential to favour existing waste management companies, with their access to merchant waste, over the new entrants encouraged to enter the market following the Kelly Report.

But a wider section of industry and the finance community are unhappy with the proposed Defra drafting. Aside from the fact that where there is no contractual exclusivity to residual waste a local authority could, in theory, divert waste away from a RWTF for commercial reasons and trigger the substitute waste mechanism, there are fundamental concerns that the drafting dilutes the concept of guaranteed minimum tonnages to such an extent that it may impact on the affordability/bankability of solutions. In particular, under the drafting, contractor revenues could be materially affected should the contractor fail to demonstrate that it has used reasonable endeavours to find substitute waste, or if the nature of the available substitute waste (e.g. calorific value, composition) is significantly different from the residual MSW provided under

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the PFI contract. *In extremis*, where substitute waste simply is not available, revenue compensation may be insufficient should lower throughputs have an impact on the core operability of the RWTF.

Aside from developing the drafting further, one obvious way to reduce this risk for all parties would be consider smaller RWTFs. However, as was highlighted in the work commissioned by Defra in 2007 (Economies of Scale – Waste Management Optimisation Study by AEA Technology Final Report, April 2007), for most residual waste treatment technologies there are considerable economies of scale; it is probably no coincidence that in 2009 it was mainly the smaller procurements (e.g. Bedfordshire, Dorset, Telford) which encountered affordability challenges. The approach of ‘low-sizing’ RWTFs also exposes the procuring authority to the many risks of a relatively high reliance on landfill.

Depending on one’s perspective, an undersized RWTF is therefore likely to either impact on the affordability of a solution or competitiveness of a bid. Getting the capacity of the RWTF right is therefore critical.

MSW arisings

The outline business case (OBC) for many waste PFIs currently in procurement were prepared several years ago using baseline tonnage data which predates the recent trends. This means that in some cases the RWTF capacities assumed in the OBC reference cases need to be challenged by bidders. For example, Tolvik’s recent analysis of one project (currently only at the ISOS (invitation to submit outline solutions) stage) revealed that the actual MSW arisings in 2008/9 were over 9% lower than that in the OBC tonnage model.

So, what would it be reasonable to assume when assessing the future levels of residual MSW? The factors influencing the levels of MSW arisings are many and complex and have been subject to a number of detailed studies (Defra – Resource Futures WR0121 – Understanding Waste Growth at Local Authority Level) which point to the need for project-specific analysis. The main upward pressures on MSW arisings in the medium to long term are likely to be as a result of the relationship between household numbers and MSW arisings and macro growth in the economy. With respect to household numbers, at a national level the ONS predicts a long-term increase of just over 1% p.a. through to 2031.

Waste Strategy 2007 sought to de-link economic growth from growth in MSW arisings and the pre-recession evidence would suggest some success in addressing this issue, in part through the introduction of producer responsibility legislation and greater public awareness. However, there is strong evidence to suggest that changes to local waste management policies

– for example, the introduction of alternate weekly collections (AWCs) and tighter control at household waste recycling centres (HWRCs) have had the greatest impact. While these measures are likely to have a one-off structural impact they are unlikely to have the same effect year after year.

When considering the scope for significant changes in MSW arisings per capita it is also worth benchmarking the UK with other European countries (particularly those regarded as being more 'advanced' in their waste management systems). Here, the results are perhaps surprising. The latest data from Eurostat for 2007 suggests that, while UK recycling is behind the rest of Europe, arisings per capita are broadly in line with the larger nations – France, Germany, Italy and Spain. While the definitions of municipal waste vary from country to country, it would seem that the UK is not significantly out of step with the rest of Europe.

Tolvik's opinion is that it would therefore seem reasonable at a national level to expect the decline in MSW arisings to tail off by 2012/13 and then move, on average, to an underlying increase of somewhere between 0.25% and 0.75% p.a.

Recycling rates

The Waste Strategy 2007 for England set a recycling target of 50% for household waste by 2020. Individual regions and local authorities have tended to set their own targets, within a general range of 50–60% but with aspirational targets of 70% also being considered. When set against the highest performers in Europe (at 60–65%), an average recycling figure of 60% may be achievable – although this will be subject to the level of investment local authorities make in the collection infrastructure and the extent to which markets for the materials which arise are developed.

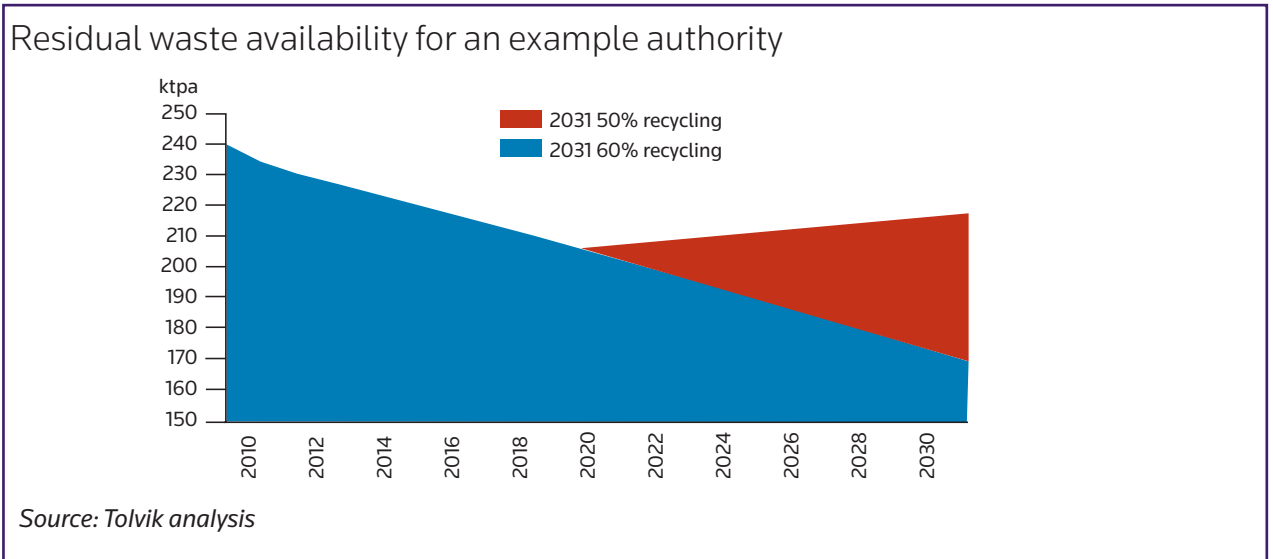
For an authority procuring a RWTF through PFI, the development of a long-term recycling strategy produces an interesting conflict. While investment in infrastructure to achieve the recycling performance in the OBC is likely to be a political (if not contractual) imperative, it is unlikely that exceeding the OBC recycling performance will represent value for money. Not only does the cost of delivering an additional percentage of recycling typically increase dramatically as the easiest to reach materials are recycled first, but an increase in recycling may also bring with it a greater risk that future residual MSW tonnages fall below the guaranteed minimum level. Therefore, apart from local political pressure from the environmental lobby, the only obvious driver for a local authority to exceed its OBC recycling rate would be if new recycling targets were to be set by central government. While this does not at present seem to be the policy direction for bidders and their

funders, the question which follows is the extent to which their investments can be protected by change in law provisions.

An example project

The issues discussed are best considered by reference to a 'typical' project for local authority with 400ktpa of MSW and with a 40% recycling rate in 2010. Figure 7.4 shows the effects of a modest increase in MSW arisings of 0.5% from 2012/13 and recycling rate rising to 50% by 2020. Residual MSW declines by 14% over this period. If there is no further improvement in the recycling rate post 2020 beyond 50%, then residual MSW tonnages recover slightly; if recycling rises to 60% by 2030 then there is a further significant deterioration in the availability of residual waste.

Figure 7.4



If a bidder can be sure that the MSW recycling rate will remain at the 50% level, the RWTF can be sized to accept circa 200–220ktpa of residual MSW. Any oversizing of the RWTF to process commercial and industrial (C&I) waste and so deliver economies of scale would be a contractor risk (supported, in the current financial markets, by a suitable security package). If the guaranteed minimum tonnage is set at 220ktpa there may be a need for up to 20ktpa of substitute waste in the middle project years. Given that this represents less than circa 10% of the total capacity of the RWTF and assuming the bidder has only designed in a modest merchant capacity, it is probable that the project can be made bankable.

If, however, the recycling rate is expected to increase to 60%, either the guaranteed minimum tonnage has to be set low (at 170ktpa) and the RWTF

sized accordingly smaller (with the consequential impact on affordability for the local authority), or kept at 200–220ktpa with the contractor being responsible in the later years for potentially finding up to 50ktpa of substitute waste in addition to any waste needed to fill planned merchant capacity.

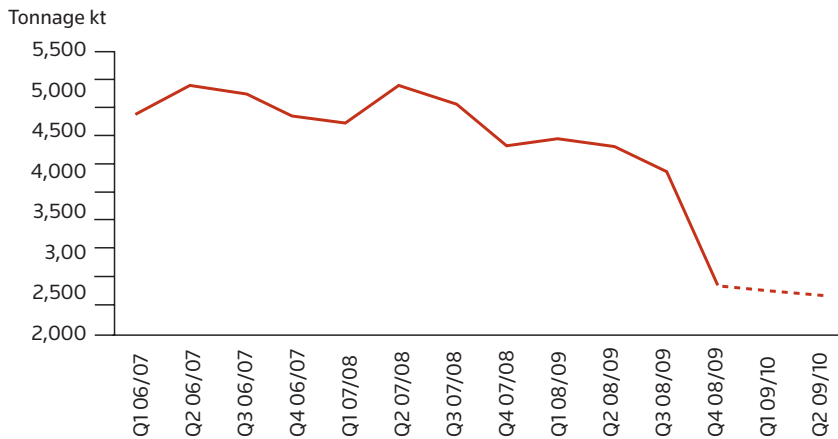
To properly assess the risks associated with finding the ‘right’ sort of substitute waste at this scale requires a detailed understanding of the local C&I waste market, and this comes at a time when funders have a lowered appetite for merchant risk.

The C&I waste market

Unfortunately, recent trends in the C&I waste market, being largely a function of the effects of the £8 p.a. landfill tax escalator increase and the recession, provide limited comfort. An analysis of HMRC landfill tax data and the quarterly municipal waste statistics released across the UK, show that across the UK in the last quarter of 2008/9, residual C&I waste to landfill, at only 2.6Mt, was 40% lower than the 4.3Mt seen a year previously. While provisional data would suggest that the rate of reduction in the availability of residual C&I waste has largely bottomed out in recent quarters, this is still a very significant market shift.

Figure 7.5

Active C&I waste landfilled in the UK, 2006–2010 (Kt)



Source: Tolvik analysis

RWTFs are likely to compete in the early years with landfills for this residual C&I waste (confident in the knowledge that there is a practical floor to the landfill gate fee of landfill tax plus marginal operating cost). Notwithstanding current market conditions, over time competition for residual C&I waste is likely to come from other (merchant) RWTFs. If the result was of an over-supply of residual waste treatment capacity, RWTFs could, if the experience in Germany is anything to go by, compete on the margins at the

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€30–€40/tonne level. In the more remote rural markets, on the one hand, the risks of lower than expected residual C&I waste supply are likely to be at their highest, but on the other, the risks of RWTF over-capacity locally may be limited. In the major urban conurbations the opposite may apply.

Understanding the balance within a ‘catchment area’ centred on a proposed RWTF between residual waste treatment capacity and the availability of residual C&I waste is therefore key to assessing both the merchant risk and the potential availability of substitute waste.

Other technical implications

With RWTFs being ‘end of pipe’ solutions, not only is the quantity of the feedstock a function of upstream activities, so too is the quality, in terms of waste composition and calorific value. For mechanical biological treatment (MBT) RWTFs, changes in composition (e.g., as a result of a roll-out of additional kerbside recycling) have the potential, depending on the RWTF’s configuration, to impact on the recycling rate which can be achieved by the RWTF, the quality of solid recovered fuel (SRF) it produces and the residence time of waste (and hence capacity) required to achieve optimal gas yields or reduction in mass and/or biodegradable content for landfilled residues.

For thermal RWTFs, changes in upstream activities can impact on the calorific value of the residual waste feedstock, not always in ways which are easy to predict. Consider the case of three incinerators in the Midlands processing almost exclusively MSW. In 2008, all the local authorities providing residual waste to the incinerators reported higher recycling and composting rates than the previous year, and yet one RWTF reported a decline in calorific value and the other two a rise. Macro changes in calorific value of the feedstock will impact directly both on electricity revenues and RWTF capacity.

While it is not uncommon for the local authority to agree boundary parameters for the composition of the residual MSW feedstock, these are typically within reasonably wide parameters and so provide only limited protection. Understanding the implications of a changing residual waste composition on the technology is therefore imperative as it will have a direct impact on the sourcing strategy for any merchant feedstock required to ensure that the RWTF operates at optimum capacity.

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