Doing the 'Dirty Work' of the Green Economy: resource recovery and migrant labour in the EU

Nicky Gregson*[1], Mike Crang*, Julie Botticello†, Melania Calestani‡, Anna Krzywoszynska*

nicky.gregson@durham.ac.uk

m.a.crang@durham.ac.uk

j.botticello@bbk.ac.uk

m.calestani@soton.ac.uk

anna.krzywoszynska@durham.ac.uk

1 Corresponding author

* Department of Geography, Durham University, Lower Mountjoy, South Road, Durham: DHI 3LE

† Birkbeck College, University of London
‡ Department of Primary Care, University of Southampton

Abstract

Europe has set out its plans to foster a 'green economy' by 2020 focused around recycling. This pan-European recycling economy, it is argued, will have the triple virtues of, first, stopping wastes being 'dumped' on poor countries; second, reusing them and thus decoupling economic prosperity from demands on global resources and, third, creating a wave of employment in recycling industries. European resource recovery is represented in academic and practitioner literatures as 'clean and green'. Underpinned by a technical and physical materialism, it highlights the clean-up of Europe's waste management and the high-tech character of resource recovery. Analysis shows this representation to mask the cultural and physical associations between recycling work and waste work, and thus to obscure that resource recovery is mostly 'dirty' work. Through an empirical analysis of three sectors of resource recovery ('dry recyclables', textiles and ships) in Northern member states, we show that resource recovery is a new form of dirty work, located in secondary labour markets and reliant on itinerant and migrant labour, often from accession states. We show therefore that, when wastes stay put within the EU, labour moves to process them. At the micro scale of localities and workplaces, the reluctance of local labour to work in this new sector is shown to connect with embodied knowledge of old manufacturing industries and a sense of spatial injustice. Alongside that, the positioning of migrant workers is shown to rely on stereotypical assumptions that create a hierarchy, connecting reputational qualities of labour with the stigmas of different dirty jobs – a hierarchy upon which those workers at the apex can play.

Key words: recycling, labour, EU, municipal waste, textile recycling, ship recycling

The recovery of secondary materials, or resources, for recycling within the EU has become central in the drive to greening European economies. Three related motivations underpin this. First, there is an environmental and geopolitical driver to decouple economic growth from the consumption of finite material resources. Resource recovery within the EU is seen as a means to sustainable production and as a way of breaking a resource dependence that is argued as leaving the EU vulnerable to capricious external powers, especially as demand from non-Western countries for the same resources increases (EC, 2011; EEA, 2011). Second, current global recycling labour occurs largely in the developing world (Alexander & Reno, 2012) and is haunted by the trope of waste workers in the Global South whose labour breaks up the iconic consumer goods of the digital age or the capital goods of globalisation – mobile phones, computers and merchant ships (BAN, 2002, 2005; Greenpeace/FIDH/YPSA, 2005). This figure has been central to the global environmental justice movement. Circulating images, often of child labour working in environmentally degrading conditions in the Global South, have served to bolster the critique of the wastefulness of western consumerism, showing that the burden of the world's waste rests on the shoulders, and is felt in the bodies, of the poorest of the poor (Clapp, 2001; cf. Crang, 2010). In response, ENGOs pressurised western states to bring recycling operations closer to the homes of western consumers. This 'proximity principle' has played a prominent role in European waste policy for the past twenty years. Third, there is the promise that elevated levels of European resource recovery might also boost EU economies, via increasing employment in the 'green economy'. Waste management companies, for example, advance claims that in the UK alone expanding recycling could create up to 84,000 jobs in the next decade, and that these might have the added virtue of being located in areas formerly associated with heavy industries (SITA 2012: p 4). In the EU, as a whole, jobs in recycling-related activities grew from 230,000 to 500,000 between 2000 and 2008, at a rate of over 10% per annum (EEA 2011: p 17)[1].

[1] The employment data in Eurostat are not structured to allow exact calculations, as waste processing occurs in various parts of the 'eco-industry' sector where overall employment rises from 2 million to 3.4 million in the

Foundational to the proximity principle is that the societies who generate the world's wastes should be those who bear the responsibility for their management. This principle is encoded in the EU's Waste Framework Directive, which seeks to prevent 'toxic' waste from being exported across the EU's borders. European waste management is further structured by the EU Landfill Directive of 1999 which sought to divert materials from landfill, and by a raft of sector specific regulations such as for End of Life Vehicles. The Landfill Directive has boosted recycling rates across the EU through the implementation of stepped yearly targets for member states. Indirectly, it has also extended the reach of ethical consumption for European consumers, to encompass the discards that are an effect of consumption (Bulkeley & Gregson, 2009). Doing the recycling has become part of a responsible consumption across the EU. It is normative, habitual, and extends care at a distance from its traditional focus on workers in the agricultural and primary manufacturing sectors of the Global South (Barnett et al. 2005) to include environmental care for distant lands and for additional distant workers. In this way, European consumers' domestic recycling labour is connected to the alleviation of environmental degradation in developing countries as well as to care for and about recycling workers in the Global South.

The question that remains unasked in these developments, however, is what kind of work has accompanied the rise of recycling *within* the EU? The academic literature thus far has largely ignored this question. Much existing research positions recycling under the banner of sustainable consumption and examines it through consumers and consumption. The interest is in the recycling habits and practices of consumers, the willingness of consumers to do the work of pre-sorting rubbish, and thus in explaining differences in recycling rates between different groups (e.g. Barr et al. 2001, 2003; McDonald & Oates, 2003; Tonglet et al. 2004; Darby & Obara, 2005; Collins & O'Docherty 2006; Wheeler & Glucksmann, 2013). In contrast, environmental research positions recycling within the wider frame of municipal waste governance (Bulkeley et al. 2007). Whilst it acknowledges the activities of collection, its focus is more on governing waste and its destination

---

period.

than on the economic effects and kinds of jobs created. Recent work on the processing of waste has focused on charting the performative effects of governance categories in defining what is waste and what is a product, and on the entanglement of material flows that result where one waste bleeds into another product (Lepawsky & Billah 2011; Lepawsky 2012). In so doing it follows the flows of materials (Gregson et al. 2010), rather than accepting an a priori definition of a production network. Such work has highlighted the importance of Global Recycling Networks (Crang et al. 2013), analysed material value translation across economies (Alexander and Reno 2012) and established the importance of resultant clusters of reprocessing industries in less developed countries that, whilst exemplifying industrial symbiosis and circular economies, are often 'dirty' and polluting rather than highly technical, clean and green solutions (Gregson et al. 2012). Nonetheless, it has pointed to the global organisation of material flows and their connection to different kinds of labour around the globe. However, it has paid little attention to recycling labour within developed countries.

In the European policy literature, recycling is represented as a classic case of 'ecological modernisation' (Pellow et al 2000), creating thousands of 'green' jobs within the EU in an innovative new sector which is argued to be beneficial to the environment, through resource conservation and appropriate waste minimisation and management, and to the economy, through generating new forms of employment. Such representations figure strongly in the two major European policy statements on green growth and the development of a European green economy: the EU Thematic Strategy on the Prevention and Recycling of Waste (EC, 2005) and the Roadmap to a Resource Efficient Europe (EC, 2011), both of which set the EU on the course to becoming a 'recycling society' by 2020. In these documents, European recycling is portrayed invariably as a clean as well as green activity.

In this paper we interrogate the representation of European resource recovery as clean and green. Our contention is that the emphasis within European recycling is on governance, which assumes a technical and physical materialism in which what matters are technological possibilities of resource

recovery and environmental outcomes. A consequence is that little or no attention has been paid to how value is created from paid labour, which does the work of resource recovery, or recycling the collected materials. Not only does this render these labour processes within the EU invisible, but that omission also allows for a portrayal of European resource recovery as clean and green. We show how a focus on recycling work as this is actually performed within Northern EU member states results in a very different reading. We draw on research in resource recovery sectors in two Northern European member states (the UK and Belgium) to show that such work is associated with the four Ds: it is dirty, often demeaning, physically demanding and in some cases, dangerous. Added to which it is extremely low paid. These characteristics have clear and predictable effects on who does this type of work, through the historical association of waste work with marginalised and foreign workers (Zimring 2004) and its intertwining with current EU labour hierarchies. Resource recovery in the Northern EU member states is work which local labour is often unwilling to do (c.f. Tannock, 2013); it is often migrant work; it is highly gendered, with patterns depending on the type of goods and materials being recovered; and it is associated particularly with workers from the A8 member states as well as non-EU nationals. As such, our research shows that, when wastes are ' sequestered within the EU's borders, it is labour that frequently moves to achieve their recovery as secondary resources.

A second contribution of the paper relates to a growing body of research on A8 migrant labour in Northern Europe. This has focused on Polish migrants, for the most part, in the UK but particularly within London, and has concentrated on the hospitality/catering and construction/handyman sectors (Baum et al. 2007; Devine et al. 2007 a, b; Datta, 2008; Datta & Brickell, 2009; Lyon & Sulkova, 2009; Wills et al. 2009; Perrons et al. 2010; Janta, 2011; Janta et al. 2011; Friberg, 2012a c.f. Stenning & Dawney, 2009). Work on female migrant workers has addressed A8 labour but has focused far more on non-EU nationals, particularly within global care chains in the domestic and health-care sectors (Cox 2007; Dyer et al. 2008; Yeates 2012; but see Perrons et al. 2010). It has emphasised how embodied attributes of workers are drawn on, and interpellated, by employers and

migrant workers at the micro scale of particular workplaces (McDowell et al. 2007). Across these literatures the term 'the hard working Pole' emerges as a key cultural category, for both employers and labour. By contrast, a focus on the resource recovery sector highlights divisions *among* A8 migrant workers. It shows a labour hierarchy in this part of the secondary labour market which has Poles either at or near its apex. In resource recovery there are jobs that Poles will not do and jobs where the 'hard working' trope is not drawn on. In certain recovery sectors associations with physically hard, dirty work, are read through a hyper-masculinism that codes such tasks with fun, pleasure and the frisson of danger. Rather than hard work, recovery work – at least in certain sectors – is seen to offer exciting, easy work, for relatively good money. The paper concludes by considering the wider ramifications of these findings with respect to A8 migrant labour and the policy goal of creating a pan-European recycling society. We begin, however, by establishing the main contours of recycling as this is discursively constructed and performed within the EU and its identification as a clean activity, central to greening economies.

Clean and green, or dirty work?

For the past thirty years waste has been at the heart of EU environmental policy. So too has a sense of progressive cleansing, in which old polluting technologies and environmentally degrading forms of waste management have been increasingly regulated out of existence and replaced with newer, modern forms of waste management. At the same time, hazardous wastes have been regulated more tightly and responsibly than in the past. This sense of progress figures strongly in recent EU strategy statements on recycling and waste:

> "Heavy polluting landfills and incinerators have been cleaned up. New techniques have been developed for the treatment of hazardous waste. Hazardous substances are being removed from vehicles and electrical and electronic equipment. The levels of dioxins and other emissions from incinerators are being reduced' (EC, 2005, p. 3).

Recycling has played an important role in environmental clean-up. Recovering materials from discarded goods, to then be recycled through further rounds of manufacturing, has been the chief means to reducing waste. In acting to reduce waste, recycling is seen to be a means to a cleaner form of consumption, and, through its increasing application to business and industry, to cleaner forms of production.

If 'cleaner' was the aim attached to recycling in the late 1980s and 1990s, the current favoured adjective is 'greener'. The EU's 2020 strategy post the 2008 financial crisis is for a smart, sustainable and inclusive EU, in which resource efficiency is seen as a means to economic and ecological security and sustainable growth. Recycling is seen to play a pivotal role within this:

> "Recycling has an essential role to play in achieving a major European and global policy priority: the shift to a green economy […] generates prosperity while maintaining a healthy environment and social equity for current and future generations. […] Today three of the most important challenges facing Europe are reducing environmental burdens, creating new jobs and enhancing the research base for the economy. Recycling can make a substantial contribution to addressing all three challenges, offering a win-win opportunity" (EEA, 2011, pp 7 – 8).

Recycling, then, sits at the heart of the EU's imagined economic transformation in the twenty-first century (EC, 2011). Providing green as well as clean high-tech growth, it is seemingly impervious to critique.

Our contention is that this representation of European recycling needs careful and critical interrogation. This is not just because the capital intensive materials recovery operations which characterise European recycling have been argued to create demand for more, not less, waste, nor because they can be argued to have led to a consumer 'rebound' effect, as doing the recycling is used to justify more, not less, consumption at the level of individual households and consumers

(Alexander & Reno, 2012). Rather, we question the degree to which European recycling activities are as clean as they are made out to be. To make this argument we first need to establish two points.

First, thinking about European recycling is dominated by a technical and physical materialism (Alexander & Reno, 2012) which is pervasive within the paradigms which dominate the recycling literature, many of which are derived from engineering and physical science[2]. It emphasises the technical possibilities of materials transformations, the efficiencies of recovery, and highlights that European recycling is modern, or highly mechanised, rather than labour intensive as is believed to dominate recycling in the Global South (c.f. Minter, 2013). The academic and policy literatures focus overwhelmingly on the possibilities for, and rates of, recovery, whilst the trade and business press focus much more on technological advances for mechanising materials characterisation, recognition and separation. From a social sciences perspective, however, a key absence here is the labour process in the developed world. This is significant since it raises social equity issues about the scale of ecological benefit versus bringing workers into closer contact with environmental hazards, often in poor working conditions (Pellow et al 2000).

Second, whilst current policy literature on European recycling makes connections to jobs and growth, it does so largely in macro-economic terms. The argument here is two-fold. First, that recycling creates more jobs than either landfill or incineration, and so is not just the better option in terms of the Waste Hierarchy but also the better option in terms of economic growth and well-being. Second, it is asserted that, as recycling rates increase across the EU, a large number of new jobs in the new green economy will be created. In this way, the link between growth and waste is not only broken but so too is the association with limiting growth which has restricted the appeal of environmentalist positions. Instead, the green economy becomes an engine for economic growth.

[2] The dominance of technical approaches is well to the fore in contributions to the key journals in the field, which include *Journal of Industrial Ecology*, *Journal of Cleaner Production*, *Resources Conservation and Recycling* and *Journal of Waste Management*.

Shifting to the micro level, however, an open question is just what types of jobs are created by the recycling sector? The European Environment Agency state:

> "Recycling makes an (…) important contribution to the green economy in terms of creating new jobs. The employment opportunities in the recycling sector include low skilled work in particular but also include medium and high skilled jobs, ranging from collection, materials handling and processing to manufacturing products" (2011, p. 14).

However, and tellingly, references to low skilled work are not present in either the trade press or in strategic level EU policy documentation, in which only medium and high skilled jobs are referred to and where headline plans for 'reducing materials use by 17% to 24%' are associated with 'creating between 1.4 and 2.8 million jobs' (EREP 2013)

Together these two points signal elisions about labour in the resource recovery sector. This has a weak and a strong form. The weak variant rests on a degree of elusiveness and slippage with regard to precisely which types of jobs are involved in the sector and at what skills level. Low skilled work is not itemised and even 'operative' tasks such as kerbside collection are represented as medium-skilled jobs. The stronger version is where labour is rendered invisible through the focus on technology and materials transformations. Both weak and strong variants are a form of rhetorical masking. The use of the adjectives 'clean' and 'green', through their associations with sustainability, environmentally-sound management, and resource efficiency, is the means to this. They work to promote, but also simultaneously protect, European recycling by shielding labour from unwelcome scrutiny.

Pioneering research on Global Recycling Networks shows that resource recovery depends on the separation, sorting and segregation of discarded goods (Botticello, 2012; Crang et al. 2013; Gregson et al. 2013). The tasks of separation, sorting and segregation relate to categories, or grades, of materials demanded by producers using the recycled materials. Sorting discarded goods into

categories is the means by which value is created in resource recovery. Categories are expressed in terms of the degree of material purity and contamination for any given product, and generally the more sorting, separation and segregation work that occurs the higher the purity of the resultant materials, and higher purity commands higher prices in the markets. Of greater significance for our argument here, however, is the nature of sorting, separation and segregation as work. It is here that connections between recycling and dirty work, in both the physical and symbolic sense, are to be drawn.

The language of purity and contamination does not just apply to material properties. Culturally waste work has long been seen as impure, contaminating and symbolically damaging in the classic sense argued by Mary Douglas (Douglas, 1966). Of necessity, separating, sorting and segregating discarded goods and materials into grades involves the physical handling of these materials, be that directly by hand or mediated through tools and machinery. Further, like mining and all forms of heavy industry, it involves an embodied work which brings workers and discarded goods, and the materials they release, into close proximity. This has potential consequences for worker's health and well-being. As we show in the next section, these characteristics tend to be known by local labour, which tends to be sceptical of the alleged clean and green nature of jobs in the resource recovery sector. In turn, this means that jobs in this sector are often taken up by casual, itinerant and migrant labour.

Finally, structural and organisational features combine to ensure that resource recovery in the EU is physically dirty work. The capital intensive nature of European plants means they require large volumes of material sourced from large geographical areas to maintain productivity levels. This is best illustrated through household recycling collections. In response to the targets associated with the Landfill Directive, more and more homes across the EU have been issued with more and/or larger bins for the recycling. Recycling collection points have proliferated in workplaces, businesses and transport interchanges, as well as in publicly accessible spaces. The economics of efficient

collection from dispersed points also generates (dirty) work. Old goods tend to have accumulated dirt. And discarded goods are rarely cleaned and cared for with the attentiveness lavished on other possessions. Collection systems too lead to discarded material and goods lingering in receptacles (up to two weeks for household wastes, sometimes years for capital goods), before being moved for onward sorting. As a consequence, materials deteriorate in quality, particularly if they are exposed to the weather; they can attract urban animal life (typically foxes and rats); and they begin to develop the instantly recognisable pungent smell that is the aroma of discarded waste goods and materials. Correspondingly, working with such materials involves working closely with dirty, often contaminated, stuff – be that discarded paper, packaging and bottles, old clothes, discarded electronics, cars or capital goods.

In sum: work in the resource recovery sector involves physically dirty tasks of separating, sorting and segregating discarded materials, or wastes. It assuredly does convert some, but not all, discarded material to secondary resources for onward processing by manufacturers and thus contributes to broader environmental benefits of resource efficiency and conservation. But to do this involves handling large amounts of physically decaying things and materials, much of which smells disgusting and some of which can be harmful. This matters for workers, who remove physical dirt to generate cleaner streams of recovered materials. Recovering secondary resources for recycling, then, may be green, but as work it is about as far away from the adjective clean as can be imagined. Resource recovery work is also invariably dirty work in the symbolic sense. Waste jobs and workers are tainted or contaminated by their association with physically impure materials. Classically 'dirty workers handle the distasteful tasks that are necessary for the effective functioning of society that others can continue to regard themselves as clean and, therefore, superior' (Ashforth & Kreiner 1999: 416). In that sense these are abject jobs – that are polluting yet necessary for society to see itself as clean (Crang 2010).

In the following section we show how the physical and symbolic combine and reinforce one another, in ways which have profound effects on who gets to do these sorts of jobs in this emergent new sector in the EU. We draw on three sectors (dry recyclables, textiles and ship recycling) to show how manual labour continues to play a critical role in many sectors of resource recovery within the EU. A new form of low skilled, low paid, dirty work lies at the heart of the EU's new green economy, much of it performed by migrants from the A8 member states.

The study is based on linked ethnographic research in the Northern European ship recycling industry, conducted between 2007 and 2009, and in the UK textile recycling industry in 2009. The former involved repeat observation work combined with visual methods in two separate yards that represent the largest actors in the EU at the time, together with informal off-site interviews with workers (Gregson et al. 2010). The latter is based on voluntary work for one month in a large London-based textile recycling factory (Botticello, 2012). Research on the UK dry recyclables sector conducted in 2011 combined interviews with managers and site visits to eight facilities, chosen to capture varying plant size and geographical location in the sector. Ethnographic methods enabled the study to extend its grasp of the labour process, for four reasons. First, official statistics use official categories to report what happens and formal interviews, especially with managers, focus on what is meant to happen. In both cases observation and photo-documentation illustrated that what actually happened in practice was in every sense messier than official accounts. Relatedly, there were clearly areas of illicit practice that would simply not be accessible otherwise. Second, ethnographic work can include the socialities of workers within and beyond the workplace, and the reputation and understanding of forms of work through gossip and informal accounts in the locality. Third, it enabled engagement with the tacit and habituated elements of work environments. Fourth, we were able to get closer to the materialities of the workplace, the embodied labour process, and the stuff being worked upon – all of which are vital in understanding 'dirty work'. We use those detailed understandings of specific illustrative cases to question the wider trends reported in official accounts.

Inside the EU's green economy: recycling 'dry recyclables', textiles and ships

Municipal MRFs and the recovery of 'dry recyclables'

Materials Recovery Facilities (MRFs) are in the vanguard of the drive to increase resource recovery in the EU. Municipal MRFs are dedicated to handling what was formerly called Municipal Solid Waste, but is now called the 'dry recyclables' stream that is collected from European households, and increasingly businesses. MRFs are capital intensive, highly mechanised plants, designed to process large volumes of waste materials and turn them into products suitable for further processing, in practice further rounds of manufacturing. Within them materials recognition and characterisation technologies separate out paper, card, glass, metals and plastics from the stream of materials. Municipal MRFs are emblematic of a mechanised, modern materials recovery regime. But, step inside these icons of clean, green and automated materials recovery and, alongside the technology, there is also a factory-based manual labour system.

The initial stages of pre-processing within Northern European municipal MRFs all take place in a small 'picking cabin'. Conveyor belts feed arriving materials to the picking cabin. It is here most employees work in teams of six to eight for between eight and 11 hours a day in what is a very noisy and confined space, standing by the belt. This is physically demanding work, governed by the speed of the belt. Journalist Alan Minter describes being shown round the equivalent process in a US municipal MRF:

> "We climb a stairway to […] the "pre-sort". Here two workers stand over a high-speed conveyor belt that carries freshly arrived, unsorted "recycling" that needs to be, well, recycled! One of them reaches out and grabs a brown plastic bag from the blur, and just as quickly it disappears, sucked up by a large vacuum tube positioned directly above

> them […]. "Not everybody can hack this job". Alan leans over to say, nodding at the speeding, blurry line. "Some people get dizzy, throw up" (Minter, 2013 p. 19).

Similarly, a senior UK waste manager recounted his experience of the picking cabin in a 'state of the art' German municipal MRF in the following terms: 'guys, all of them Turks, stripped to the waist, sweating like pigs and working in 90 degrees'.

The pickers' task is to pull off the belt anything that either should not be in the recyclables stream or which is too problematic for the MRFs capital intensive, mechanised systems to handle. Interviews with managers of municipal MRFs suggest that such problems are commonplace. Over-sized card and the wrong sorts of plastics often turn up on the belt, as does pretty much whatever else one can imagine – hospital waste, dead animals, plastic paddling pools and car tyres, even wheelie bins themselves. This is because recycling bins, much like all bins associated with the waste stream, are a means to getting rid of unwanted, undesirable stuff, as waste workers openly acknowledge[3]. For workers therefore, gloves and masks are not just imposed by health and safety rules, but regarded as necessary just to do this dirty work. So too are ear phones, iPods and MP3 players, so that music can alleviate both the noise and the monotony of the work.

Physically demanding, monotonous, often disgusting, as well as noisy and smelly, work as a picker in a municipal MRF meets all the criteria that characterise dirty work, and the pay is typically minimum wage. Physically dirty work also becomes culturally 'dirty work'. Much as in a host of other sectors, such as kitchen work, hotel housekeeping and cleaning, in the resource recovery sector embodied work combines with the cultural signifiers of dirt and waste to ensure that the people who do these kinds of jobs are more likely to be certain types of workers than others. Municipal MRF managers are reluctant to publicise it, to grant access to their workers, or to discuss labour in anything other

[3] In a BBC Four documentary, 'The Secret History of Waste', retired waste workers recounted tales from the waste conveyor belt, citing one instance in which the belt had to be stopped because of the appearance of a dead baby amidst the material. Although the exception, such occurrences illustrate the general point, and they are confirmed by intermittent media reports of dead human bodies in materials recovery facilities and recycling centres (http://www.mrw.co.uk – 15/05/08; http://www/liverpoolecho.co.uk - 06.09.12).

than general terms, but UK agency advertisements which specify that 'Polish language skills' are desirable for MRF cabin process workers are more than suggestive of just who gets to do these jobs.

Materials recovery via European municipal MRFs, then, may be mechanised and modern, but it simultaneously depends on hard, dirty, manual factory work – the kind of low paid assembly line working that largely disappeared from Northern and Western Europe with the flight of manufacturing capital to Asia. As we show with reference to other parts of the resource recovery sector, these characteristics repeat themselves across different types of materials recovery.

Textile recycling

Textile recovery is similar to MRFs in that discarded textiles are collected from diverse sources. In the UK this would include recycling banks, charity shops, and leftovers from car boot sales which are then brought to recycling plants for processing. The difference, however, is that, even in the UK, textile recycling is a highly labour intensive process throughout and shifts in large factories would typically involve over 100 workers at a time. Clothes are first separated by type and then sorted by wear, fibre type, weight, size, age and gender. A series of conveyor belts pass clothing around a factory, with workers handling, inspecting, assessing and classifying items by 'picking' them from the belt and then throwing them into the appropriate chutes, pigeon holes, bins or other conveyor belts. These initially classified garments then move round the factory for further assessments by other workers. In such a way classifications are refined and finer grade distinctions produced, each one tailored to a market niche – from vintage/retro, to export for reuse to industrial rags to fibre reclamation (Crang et al, 2013). The sometimes more than 400 resultant grades ensure not only that clothing has a second life but also that the maximum economic value is extracted from the clothing on the belt, through a variety of reuse and recycling markets.

As with manual work in a municipal MRF, textile recycling is physically demanding. The toll the work takes on workers' bodies is considerable. Allergies to dust are commonplace; so too are skin

complaints, for workers in textile recycling plants do not use gloves. Instead, they must rely on haptic, as well as visual, senses to classify what is unpleasant, smelly and often soiled, clothing. Workers resort to over-the-counter remedies, such as nasal inhalers, to attend to excessive sneezing and running noses, whilst many bring additional shoes to alleviate the effects of standing in the same spot for hours on end. As with municipal MRFs, the pay is low: in 2011 in the factory studied, all sorters earned £5.73 per hour, so standard weekly take home pay amounted to less than £200. Working overtime, at £7 per hour, brought it slightly above £200 which is still less than two-thirds the UK median wage.

Textile recycling, like much textile work the world over, is gendered as primarily women's work but, as with other areas of low paid 'dirty work', it is particular women who get to do this work. In the study factory, Russian was the lingua franca, and the women working on the lines mostly came from Eastern Europe, principally Lithuania, Bulgaria and Russia, but not Poland. UK nationals were also notable by their absence, with the floor manager observing they 'would be better off on the social'. In previous years, the work force had been dominated by West Africans, by workers from the Caribbean, and before then by workers from Pakistan. In each labour market phase, prevailing ethnicities relate to their perceived knowledge of key international markets in second-hand textiles (c.f. Abimbola, 2012), which currently are West Africa, India and Eastern Europe. Thus, when one textile recycler in the East Midlands was prosecuted for employing 30 illegal immigrants there were 21 Ghanaians, six Indians, two Nigerians and one from Niger (Materials Recycling World, 24 March 2014). For the factory studied, ensuring that the best items get placed on the lines destined for Eastern European markets mattered most, and Eastern Europeans were assumed (by employers) to have unique skills in making these value judgements. Moreover, in this factory such essentialising knowledge connected with internal quality controls, in which employee numbers were placed on Eastern European sorting bags, making individual employees accountable for their grading decisions.

Recruitment to textile recycling factories such as this is largely word-of-mouth. Perhaps surprisingly, labour turnover was not particularly high – at least in the study factory. It was not uncommon here to find workers who had been in this factory for six years, or even in one instance, 16. Whilst explanations for inertia from managers would typically suggest that this kind of work was the best that such workers could either do, or hope for, sheer exhaustion and tiredness at the end of each shift 'lock' workers in to such patterns of work. It is perhaps such working conditions that suggest why reports like 'Well dressed? The present and future sustainability of clothing and textiles in the United Kingdom' (2006, University of Cambridge Institute for Manufacturing) speak of the technical possibilities of recycling but make no mention at all of the work involved.

Ship recycling

In contrast to the municipal MRF and textile recycling sectors, which rely on processing materials 'harvested' from households on a regular basis, European ship recycling is a volatile, low frequency, activity, reliant on the release of vessels into the scrap market, chiefly from member states' navies and the fishing fleet[4]. As such, the work is project-based and characterised by temporary contracts. Below management levels, the work shows a strong tripartite division of labour. At the top of the labour hierarchy is asbestos remediation and hot and cold metal cutting, both of which require workers to have the requisite level of training and certification. Below this, a range of assistant jobs include fire watching, driving and a variety of metal work. At the bottom of the hierarchy are the sorting jobs, all of which involve separating materials, chiefly metals, into categories. Some of this work is performed mechanically, typically by magnets attached to driver-operated heavy plant equipment. This separates ferrous metals from the lower volume, but higher value, non-ferrous metals. Further separation of non-ferrous metals is performed manually, typically by agency workers. All this work is filthy work. It is outdoor work, surrounded by rust and falling metal; the

[4] Ocean-going commercial vessels are typically recycled in South and East Asia, amid considerable opprobrium over labour and environmental conditions and are a poster child example for ENGOs of why recycling should be done in the EU (Crang, 2010).

fumes released by hot metal cutting cannot be avoided; and hazardous wastes and residues are all around (Gregson, 2011). With the exception of a few environmental testers, this is work performed exclusively by men, but there are key distinctions in who does which jobs.

Invariably, ship recycling within Europe entails itinerant, and often migrant, work. Its basis in project work, with ships sent to different facilities, ensures this, but so too does the interchangeability of some of its associated tasks. Asbestos remediation work, for example, covers buildings as well as end-of-life ships. Asbestos-remediation workers follow contracts, both within EU member states and between them. One job may be a ship, another a building such as a hospital or school; another may be a power station and yet another a retail store. The metal cutting work within ship recycling also fails to attract local labour and relies instead on migrant work. Sometimes, and paralleling Tannock's (2013) work on meat processing factories in Wales, this relates to the poor reputation of particular firms in local labour markets. But it goes deeper. EU environmental regulations may suggest that former ship building areas in the EU offer the most appropriate infrastructure for ship recycling operations, and green economy documents point to job creation in former industrial areas (EEA 2011), but local labour is often unwilling to take up jobs in the industry, even in areas where there are relatively high levels of unemployment. Instead, we encountered almost universal scepticism among locals over a rhetoric which positions ship recycling as offering jobs in a clean and green industry. This is grounded firstly in embodied knowledge; of the effects on lives of working in the ship building industry and of what materials went into the making of these ships, and of what would be released in their unmaking, principally asbestos (Johnston & McIvor, 2000, 2004). Local people spoke about knowing the stuff that went into ships and would equally come out of them. Secondly, there is a sense of social and spatial injustice. The argument frequently articulated is that, having lived and worked once with dirty industries, these communities do not want to repeat the experience – that it is 'some place else's turn'. This argument was made on multiple occasions by local campaign groups in the UK in relation to the Hartlepool 'ghost ships' (Hillier, 2009) and was

repeated throughout a protracted legal case[5]. Even once the work had begun, local people continued to recite the argument and to refer to the transient male Eastern European labour that allegedly had been brought into the town to do it. Rumours of 'Poles living in caravans' on site were rife. In this instance therefore interpellation worked across local and migrant labour groups, and not just within firms. From the perspective of local labour, 'Poles' became a generic term for ECE labour who were seen as 'mad enough' and 'foolhardy' enough to risk working in this particular firm and in this anticipated-to-be-dirty industry. Thus, whilst EU policy attempts to ensure that 'some place else's turn' does not occur, intergenerational knowledge of asbestosis and mesothelioma, and of the risks of metal work, combine with stereotypical views to keep the indigenous labour force out of this sector and to see this work as appropriate for others to do.

Inside ship recycling yards, as with textile recycling, the labour hierarchy frequently maps into ethnic distinctions. This is illustrated by an established ship recycling operation located in continental Northern Europe. The entirety of the work here is organised through sub-contract chains, with different companies hired to perform distinct phases of work. Separate Dutch companies were contracted to perform asbestos removal and hot cutting for the duration of the project. All the workers employed by them were itinerant Dutch. Basic sorting functions in the yard however were performed by Turkish-French workers. At a given point in breaking up a ship the priority becomes processing the bulk of the metal quickly to sell it on, and at that point additional workers were hired on temporary contracts via agencies known through personal contacts to the management. The majority of the workers hired were Poles, who were supplemented with Czechs at a point where further additional labour was required. The pay differentials for workers were considerable: whilst Dutch hot metal cutters earned €36.50/hour, the agency was paid €20/hour, and the Polish workers actually received €10/hour. So, the former earned three times and the latter 80% of median Belgian income. In this way the sector exhibits a classic core/peripheral worker distinction, in which low-

[5] The 'ghost ships' were vessels from the US reserve fleet and of Second World War vintage. Since the US banned exporting them to less developed countries, it was open to a UK tender to dismantle them. The importation of such waste caused a local, indeed national, furore.

cost ECE labour, supplied via agencies, is used to provide numerical flexibility (c.f. Friberg, 2012a). Polish employment in this yard is also noteworthy for three further reasons. First, it confirmed the down-skilling trajectory noted in the literature in relation to E-W migration (Drinkwater et al, 2008 c.f. Bachan & Sheehan, 2011). The Poles recruited here had previously worked as carpenters, welders, truck drivers and car mechanics in Poland. Second, their employment histories in Western Europe illustrated considerable mobility between EU member states (c.f. Stenning & Dawley, 2009; Friberg, 2012b) – in this case, between the UK, Belgium and the Netherlands, where they had previously performed a variety of construction and warehousing jobs. Third, and most significantly, the Polish men working in this yard did not recite the mantra of 'the hard working Pole' (c.f. Datta & Brickell, 2009). Instead, they talked about their work as relatively undemanding, valuing their boss for not pushing them too hard; and in terms of fun and pleasure. Although the lower pay was a source of considerable grievance, the work itself was valued for its unpredictability, excitement and even for its danger – particularly when this came at the expense of mistakes made by Czech workers, whose inexperience resulted in a major fire incident in the yard. Tales of individuals collapsing through the effects of exposure to the fumes of hot cutting, of the danger of the work, of using short cuts rather than doing the job properly, and of learning on the job were all narrated positively through the figure of the tough, fearless to the point of reckless, strong and heroic Polish male – a classic case of reframing dirty work through positive characteristics (Ashforth & Kreiner, 1999) though ones that here lead to their own problems. Hyper-mobility in relation to temporary work is critical for its potential occupational health risks, particularly when combined with a hyper-masculine revelling in fun, danger and unpredictability. However, in contrasting their knowledge and expertise to the lack of knowledge of their Czech counterparts, these Polish workers drew a clear distinction between categories of ECE labour, in this case based on ethnicity and hyper-masculinism. These Polish men were differentiating dirty work in ways that strengthened their group identity not through tropes of 'hard working Poles' but exuberance.

Summary: resource recovery within the Northern European member states has resulted in low paid, dirty, monotonous and physically demanding jobs, some which are physically dangerous. These characteristics cut across different forms of materials recovery. Cultural categorisations combine with the physical characteristics of the work to make European resource recovery a dirtier form of dirty work than that which occurs in the hospitality and catering sectors and on a par with health care-related body work (McDowell et al, 2007; Dyer et al, 2008). This is because it entails working directly with wastes. It may recover secondary resources but it means handling material that is already declared to be waste, and therefore expelled from the body social. In such a way the veneer of green jobs is stripped off. Recycling work is an activity which comes within the cultural orbit of waste work the world over. Furthermore, regardless of where this type of work occurs in the world, its performance – and particularly who gets to do it – works with and from workers' embodied attributes as well as stereotypical ideas. Waste work globally has long been seen as a means to marking ethnic and racial, as well as gendered, differences. It is therefore not surprising that it has become a means to inscribing distinctions between workers from the former EU-15 and those from the A8 countries and non-EU countries. The distinctions drawn within and between the A8 group of migrant workers (Poles versus other nationalities) however, point to finer grained understandings of the ECE labour force. Differentiated processes of interpellation work both between but also within resource recovery workplaces and local labour markets. Particularly significant is how a hyper-masculinism once characteristic of former manufacturing areas in Northern member states has resisted recycling work, but how that same hyper-masculinism is being reworked within the ECE labour force, to reclaim such labour. More broadly, our research shows that the growth of resource recovery activities in Northern Europe rests on and exacerbates uneven development in the EU (Smith & Timar, 2010). It both relies on low-cost ECE labour and is a means by which hierarchies in ECE labour are emerging and intensifying. We conclude the paper by reflecting more broadly on the wider implications of these findings.

Conclusion

European policy promotes resource recovery in Europe as a clean and green activity central to creating sustainable economies within the EU-27. 'Lifting the veil' on European resource recovery shows it to be far from clean and green but instead a new form of 'dirty work.' When waste is not allowed to be processed in peripheral places, in the name of environmental justice, then peripheral workers tend to move to do the jobs created instead. The implications of this are three-fold.

First, in terms of the recycling labour process: the paper has demonstrated that resource recovery, wherever it occurs, with whatever materials, continues to require manual labour. Whilst representations of European recycling emphasise mechanisation and automation, highlighting a connection with modernity and a distancing from images of recycling in the Global South, manual labour is necessary to the creation of value in European resource recovery. The work of materials segregation and sorting continues to involve people, whose work has been shown to be amongst the dirtiest of European 'dirty work'. That fundamental point is masked by the discursive construction of European recycling as clean and green. The clean and green veneer serves to protect European resource recovery from too much scrutiny and obscures how recycling work is socially and culturally constituted as 'dirty work', precisely because it is waste work. Our contention is that it is important to recognise these jobs as such, for what they are, rather than to engage in a politics of silence and/or erasure.

Second, in terms of migration and its intersections with uneven transformations across Europe: the paper has demonstrated that, far from creating new skilled employment, resource recovery is for the most part located within secondary labour markets and often rests on migrant labour, be that low-cost, itinerant EU labour or that of non-EU nationals. The implications for debate on post-2004 enlargement and its effect on migration are considerable. Whilst that literature emphasises new ways of thinking about migration based on open borders, mobility and temporality, our research joins with a body of work in economic geography to show how old East-West distinctions are being reworked through the core/peripheral labour distinction in Northern Europe. It demonstrates that

the opening of borders to people can be a means to reworking and intensifying inequalities (Smith & Timar, 2010) which can be further intensified by the closing of borders to wasted things. Old East-West distinctions are being reworked in relation to the drive to create green economies in the EU, precisely because the jobs that are being created by keeping wastes within Northern Europe are not ones that many Northern Europeans seem to wish to do. This raises profound question marks over the capacity of sustainable economies to deliver the social inclusivity which also sits at the heart of the EU's 2020 strategic vision.

Third, the goal of creating a pan-European recycling society requires pan-European resource recovery. This paper has shown that resource recovery in Northern European states depends on migrant labour from A8 countries willing to do 'dirty work' abroad for higher pay, which begs questions as to how to extend and intensify levels of resource recovery in the A8 states themselves, where recovery rates are still at very low levels but rates of employment in recycling are relatively high (Eurostat 2009, page 333). Very real questions need to be asked as to who is going to do this kind of 'dirty work' in Eastern and Central Europe. Historically, waste work in ECE has been associated with the Roma, as an itinerant, petty-entrepreneurial activity, of a type not far removed from resource recovery in parts of the Global South (Scheinberg & Anschtz 2006: 263-4). As capital intensive, highly mechanised resource recovery infrastructure moves east, with plastics recovery plants being opened in Poland by Austrian multinational Alpla taking with it a demand for the types of manual labour already visible in the Northern member states, a strong possibility is that further cultural reworking will occur around this green, but dirty, work. An effect of uneven transformations in the development of resource recovery in the EU is that, ironically, future growth in resource recovery may yet rest on opening borders to workers from non-EU countries – the very workers whom the initial interventions in European waste policy, some 30 years ago, was designed to protect. The rise in immigration to Poland from 7,000 to 212,000 people per annum over the last decade is certainly suggestive here, but the topic needs empirical investigation as to the organisation of work and the values being associated with changing types of 'recycling' work. Precisely because of

its irrevocable associations with waste and with 'dirty work', resource recovery will always be intrinsically bound up with race and ethnicity. As resource recovery shifts east within the EU, to encompass the predominantly white, post Socialist states, we anticipate those debates taking on yet new twists and a new intensity.

Acknowledgements

Tbc post review

Web sites

Male body found at MRF in Crayford – http://www.mrw.co.uk/home/male-body-found-at-mrf-in-crayford 13004198.article – 15th August 2008 (Accessed 10 January 2013)

Man's body found at Wirral recycling centre after tragic accident – http://www.liverpoolecho.co.uk – 6th September 2012 (Accessed 10 January 2013)

Thirty illegal workers arrested at textile recycler – http://www.letsrecycle.com (26 March 2014)

References

Abimbola O (2012) The international trade in secondhand clothing: managing information asymmetry between West African and British traders, *Textile* 10(2): 184 – 99.

Alexander C, Reno J (Eds. 2012) *Economies of Recycling: the global transformation of materials, values and social relations* (London: Zed Books)

Ashforth, B, Kreiner G (1999) "How Can You Do It?": Dirty Work and the Challenge of Constructing a Positive Identity, *The Academy of Management Review* 24(3): 413-434.

Bachan R, Sheehan M (2011) On the labour market progress of Polish Accession workers in South-east England, *International Migration* 49 (2); 241 – 49.

Barnett C, Cloke P, Clarke N, Malpass A (2005) Consuming ethics: articulating the subjects and spaces of ethical consumption, *Antipode* 37(1): 23 – 45.

Barr S, Ford N, Gilg A (2003) Attitudes towards recycling household waste in Exeter, Devon: quantitative and qualitative approaches, *Local Environment* 8(4); 407 – 21.

Barr S, Gilg A, Ford N (2001) A conceptual framework for understanding and analysing attitudes towards household waste management, *Environment and Planning A* 33(11); 2025 – 48.

Basel Action Network (2002) *Exporting Harm: The high tech trashing of Asia* (Seattle: Basel Action Network).

Basel Action Network (2005) *The digital dump: Exporting re-use and abuse to Africa* (Seattle: Basel Action Network).

Baum T, Dutton E, Karimi S, Kokkranikal J, Devine F, Hearns N (2007) Cultural diversity in hospitality work, *Cross Cultural Management: an international journal* 14 (3): 229 – 39.

Botticello J (2012) Between classification, objectification and perception: processing second-hand clothes for recycling and reuse, *Textile: the journal of cloth and culture* 10: 164 – 83.

Bulkeley H, Gregson N (2009) Crossing the threshold: municipal waste policy and household waste generation, *Environment and Planning A* 41(4): 929 – 45.

Bulkeley H, Watson M, Hudson R (2007) Modes of governing municipal waste, *Environment and Planning A* 39(11): 2733 – 53.

Clapp J (2001) *Toxic Exports: the transfer of hazardous wastes from rich to poor countries* (Ithaca NY: Cornell University Press).

Collins A., O'Doherty R, Snell M (2006) Household participation in waste recycling: Some national survey evidence from Scotland, *Journal of Environmental Planning and Management* 49(1): 121-140.

Commission of the European Communities (2005) Taking sustainable use of resources forward: a thematic strategy on the protection and recycling of waste (Brussels: European Commission)

Cox R (2007) The Au Pair Body: Sex Object, Sister or Student? *European Journal of Women's Studies* 14 (3):281-296.

Crang M (2010) The death of great ships: photography, politics and waste in the global imaginary, *Environment and Planning A* 42(5): 1084 – 102.

Crang M, Hughes A, Gregson N, Ahamed F, Norris L (2013) Rethinking governance and value in commodity chains through global recycling networks, *Transactions Institute of British Geographers* 38 (1): 12 – 24.

Darby L, Obara L (2005) Household recycling behaviour and attitudes towards the disposal of small electrical and electronic equipment, *Resources, Conservation and Recycling* 44(1): 17 – 35.

Datta A (2008) Building differences: material geographies of home(s) among Polish builders in London, *Transactions Institute of British Geographers* 33 (?): 518 – 31.

Datta A, Brickell K (2009) We have a little bit more finesse, as a nation? Constructing the Polish worker in London's building sites, *Antipode* 41 (?): 439 – 64.

Devine F, Baum T, Hearns N, Devine A (2007a) Cultural diversity in hospitality work: the Northern Ireland experience, *The International Journal of Human Resource Management* 18 (2): 333 – 49.

Devine F, Baum T, Hearns N, Devine A (2007b) Managing cultural diversity: opportunities and challenges for Northern Ireland hoteliers*, International Journal of Contemporary Hospitality Management* 19 (2): 120 – 32.

Drinkwater S, Eade J, Garapich M (2008) Poles Apart? EU enlargement and the labour market outcomes of immigrants in the UK, *International Migration* 57 (1): 161 – 90.

Dyer S, McDowell L, Batnitzky A (2008) Emotional labour/body work: The caring labours of migrants in the UK's National Health Service, *Geoforum* 39 (6):2030-2038.

Douglas M (1966) *Purity and Danger* (London: Routledge)

European Commission (2011) Roadmap to a Resource Efficient Europe (Brussels: European Commission).

European Environment Agency (2009) Wastes without Borders: transboundary shipments of waste (Copenhagen: European Environment Agency)

European Environment Agency (2011) Earnings, jobs and innovation: the role of recycling in a green economy (Copenhagen: European Environment Agency)

European Resource Efficiency Platform (2013) Action For A Resource Efficient Europe (Brussels)

Eurostat (2009) *European Business: facts and figures*. Luxembourg, EU Commission.

Friberg J (2012a) Culture at work: Polish migrants in the ethnic division of labour on Norwegian construction sites, *Ethic and Racial Studies* 35 (11): 1914 – 33.

Friberg J (2012b) The stages of migration. From going abroad to settling down: post accession Polish migrant workers in Norway, *Journal of Ethnic and Migration Studies* 38 (10): 1589 – 1605.

Greenpeace/FIDH/YPSA (2005) End-of-life ships: the human costs of breaking ships. Retrieved from http://www.greenpeace/org/raw/content/international/press/reports/end-of-life-the-human-cost-of.pdf

Gregson N (2011) Performativity, corporeality and the politics of ship disposal, *Journal of Cultural Economy* 4(2): 137 – 56.

Gregson N, Crang M, Ahamed F, Akter N, Ferdous R (2010) Following things of rubbish value: end-of-life ships, 'chock-chocky' furniture and the Bangladeshi middle class consumer, *Geoforum* 41(6): 846-54.

Gregson N, Watkins H, Calestani M (2010) Inextinguishable fibres: asbestos and the vital materialism of demolition, *Environment and Planning A* 42(5): 1065 – 83.

Gregson N, Crang M, Ahamed F, Akter N, Ferdous R, Foisal S, Hudson R (2012) Territorial Agglomeration and Industrial Symbiosis: Sitakunda-Bhatiary, Bangladesh, as a Secondary Processing Complex, *Economic Geography* 88(1): 37-58.

Gregson N, Watkins H, Calestani M (2013) Political markets: recycling, economization and marketization, *Economy and Society* 42 (1): 1-25.

Hillier J (2009) Assemblages of justice: the 'ghost ships' of Graythorp, *International Journal of Urban and Regional Research* 33(3): 640 – 61.

ILO (2004) Addressing the exploitation of children in scavenging (waste picking): a thematic evaluation of action on child labour. Geneva: International Labour Organisation.

Janta H (2011) Polish migrant workers in the UK hospitality industry: profiles, work experience and methods for accessing employment, *International Journal of Contemporary Hospitality Management* 23 (6 – 7): 803 – 19.

Janta H, Ladkin L, Brown L, Lugosi P (2011) Employment experiences of Polish migrant workers in the UK hospitality sector, *Tourism Management* 32 (5): 1006 – 19.

Johnston R, McIvor A (2000) *Lethal work: a history of the asbestos tragedy in Scotland* (Glasgow, Tucknell Press).

Johnston R, McIvor A (2004) Oral history, subjectivity and environmental reality, *Osiris* 2nd Series, 19: 234 – 49.

Lepawsky J (2012) Legal geographies of e-waste legislation in Canada and the US: Jurisdiction, responsibility and the taboo of production, *Geoforum* 43(6): 1194-1206.

Lepawsky J, Billah M (2011) Making Chains that (Un)Make Things: Waste-Value Relations and the Bangladeshi Rubbish Electronics Industry, *Geografiska Annaler B* 93(2): 121-139.

Lyon A, Sulcova D (2009) Hotel employers' perceptions of employing Eastern European workers. A case study of Cheshire, UK, *Tourism, Culture and Communication* 9 (1/2): 17 – 28.

McDonald S, Oates C (2003) Reasons for non-participation in a kerbside recycling scheme, *Resources, Conservation and Recycling* 39(4): 369 – 85.

McDowell L, Batnizky A, Dyer S (2007) Division, segmentation and interpellation: the embodied labours of migrant workers in a Greater London hotel, *Economic Geography* 83 (1): 1 – 25.

Minter A (2013) *Junkyard Planet: travels in the billion dollar trash trade* (London: Bloomsbury).

Pellow D N, Schnaiberg A, Weinberg A (2000) Putting the Ecological Modernisation Thesis to the Test: The Promises and Performances of Urban Recycling, *Environmental Politics* 9(1): 109-137.

Perrons D, Plomien A, Kilkey M (2010) Migration and uneven development within an enlarged EU: fathering, gender divisions and male migrant domestic services, *European Urban and Regional Studies* 17 (2): 197 – 215.

Ryan L, Sales R, Tilki M, Siara B (2008) Social networks, social support and social capital: the experiences of recent Polish migrants in London, *Sociology* 42 (4): 672 – 90.

Scheinberg A, Anschtz J (2006) Slim pickin's: Supporting waste pickers in the ecological modernization of urban waste management systems, *International Journal of Technology Management & Sustainable Development* 5(3): 257-270.

SITA (2012) Driving Green Growth: The role of the waste management industry and the circular economy.

Smith A, Timar J (2010) Uneven transformations: rethinking the spaces of economy and society 20 years after the collapse of state socialism, *European Urban and Regional Studies* 17 (2): 115 – 25.

Stenning A, Dawley S (2009) Poles to Newcastle: grounding new migrant flows in peripheral regions, *European Urban and Regional Studies* 16 (3): 273 – 94.

Tannock S (2013) Bad attitude? Migrant workers, meat processing work and the local unemployed in a peripheral region of the UK, *European Urban and Regional Studies* DOI: 10.1177/0969776413481986

Thiel D (2007) Class in construction: London building workers, dirty work and physical cultures, *British Journal of Sociology* 58 (2): 227 – 51.

Tonglet M, Phillips P, Bates M (2004) Determining the drivers for householder pro-environmental behaviour. Waste minimisation compared to recycling, *Resources, Conservation and Recycling* 42(1): 27-48.

Wheeler K, Glucksmann M (2013) Economies of Recycling, 'Consumption Work' and Divisions of Labour in Sweden and England. *Sociological Research Online* 18(1): 9.

Wills J, May J, Datta K, Evans Y, Herbert J, McIlwaine C (2009) London's migrant division of labour, *European Urban and Regional Studies* 16 (3): 257 – 71.

Yeates N (2012) Global care chains: a state-of-the-art review and future directions in care transnationalization research, *Global Networks* 12 (2):135-154.

Zimring C (2004) Dirty Work: How Hygiene and Xenophobia Marginalized the American Waste Trades, 1870-1930, *Environmental History* 9(1): 80-101.