



# DRIVING GREEN GROWTH

The role of the waste management industry and the circular economy



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# FOREWORD

The potential for the waste management industry to help the UK meet some of its most challenging goals – on jobs, on growth, on green energy – is substantial, but often overlooked. The industry has a track record, even in challenging economic times, that supports claims that it can deliver on all these fronts over the next decade and beyond.

SITA UK has examined the potential for the UK's waste sector to contribute substantially to this development. Drawing on our extensive knowledge as one of the country's leading waste management and recycling companies, we look at historical trends, models of waste flow and facility development, as well as other publically available information, to construct a vision of the UK waste, resource and energy sector through 2020 and beyond. We consider the investment, infrastructure and policy initiatives required to grow the sector and the employment opportunities that could accrue.

The sector's performance, especially in terms of innovation and its consistent ability to find solutions to seemingly intractable problems makes a strong case that, with the right support, it can play a central role in bridging the 'green gap' and helping the UK meet its goals of transitioning to an eco-friendly economy.

SITA UK is one of the companies leading the way towards resource efficiency, where innovation in recycling and energy generation, through existing and planned projects, is helping to create jobs in this vibrant and increasingly eco-friendly sector. Taking the environmental circular economy and building a truly integrated financial and environmental circular economy is a goal that can be realised.



A handwritten signature in black ink, which appears to read 'D. Palmer-Jones'.

**David Palmer-Jones**  
Chief Executive Officer, SITA UK

## EXECUTIVE SUMMARY

The UK waste management and recycling sector is developing rapidly and is not only contributing significantly to carbon reduction, resource recovery and the nascent green economy, but is predicted to continue to grow through 2020 and beyond. The UK has a unique opportunity to revitalise its economy by changing the way it manages its waste and uses the products recovered. Investing in much-needed new waste treatment facilities will create employment opportunities both directly and indirectly. At a time when the demand for alternative energy supplies is higher than ever, energy recovered from waste could help to make the UK more self-sufficient and provide a source of reliable green energy supply. It is not only important to recycle useful materials, but to maximise the amount of dismantling and refurbishment or use of those materials in the UK. Reusing recyclables in the UK to manufacture new goods for sale also has significant potential to help reinvigorate the UK's manufacturing industry – to create a 're-manufacturing' sector that's employment potential could significantly exceed that of the waste management numbers predicted in this report.

Using the principle of the 'circular economy', where waste is treated as a secondary resource and recycled and recovered materials and energy are returned to the general economy, SITA UK estimates that the UK waste management sector could:

- + Provide opportunities for £20 billion<sup>1</sup> to £25 billion of investment in new infrastructure, including new waste treatment facilities for all waste streams, over the next decade.
- + Create up to 84,000 new jobs, directly and indirectly (including construction), over the next decade. Many of these would be concentrated near higher population areas, with the larger energy or resource recovery facilities more likely to be in traditional 'heavy industry' areas of the country. Many of these new jobs will generally require higher levels of skills.
- + Bring many tens of millions of tonnes of valuable and useful secondary commodities to market, providing the potential to reduce virgin material imports and feed local manufacturing.
- + By 2020, potentially increase waste-derived renewable electricity from waste to between 11 and 16 terawatt hours. The UK is committed to generate 30 per cent of electricity from renewable sources by 2020. Between 11 per cent and 15 per cent of this target could potentially be met by energy-from-waste. In addition, a third of the country's residential gas demand (up to 12 per cent of total UK demand)<sup>2</sup> could be met by the waste management sector.

The UK could reach these targets with greater support from Government's incentive mechanisms for waste-derived resource and energy capacity which are currently overshadowed and thus driving projects that would otherwise be sited in the UK to elsewhere in the world. For instance, in the last decade or so in excess of 440,000 new jobs have been created in China dealing with waste electrical and electronic equipment dismantling and related activities for equipment generally arising from the developed world<sup>3</sup>.

## THE CIRCULAR ECONOMY AND GREEN GROWTH

### THE OPPORTUNITIES

It is now widely accepted that we need to change from being a throwaway society to one that recognises the importance of preventing waste and where it cannot be prevented, giving waste materials a second life. In other words, we need to foster a 'circular economy', a truly integrated policy framework that locks resource and energy use, production, consumption and waste management into a virtuous circle. By driving the circular economy, we create investment opportunity, innovation, green energy, growth and jobs from a sector that previously was occupied mainly with the unloved task of managing and disposing of society's waste. The recent past shows that the potential for the sector is exceptional, from greater efficiency in materials usage, to making a substantial contribution to reducing carbon through re-use and recycling and through the generation of significant renewable energy.

In 2009, Friends of the Earth estimated that 24 million tonnes of valuable resources were still being placed in landfill based on 2008 estimates<sup>4</sup>. Since 2008, Environment Agency data shows that in excess of 10 million tonnes of materials have been removed from landfill, much of which was directed to recycling or energy recovery.

The European Union (EU) and national governments have put in place policies to foster resource-efficient economies, to not only address the problems of waste but to put resource-efficiency at the heart of economic growth plans. The European Commission adopted in September 2011 a 'roadmap to a resource-efficient Europe' that recognises both the need for and the opportunities of adopting policies that more effectively manage resources, especially by fostering a much greater level of efficiency in the waste, energy and recycling sectors. The various EU legislation governing the treatment of waste in the member states, particularly the Waste Framework Directive 2008 are driven by a hierarchy of actions in the following descending order of priority: prevention, preparing for re-use, recycling, other recovery (notably energy) and disposal. The legislation has tightened up the rules for the industry, but has also given clear signals about where the opportunities lie.

As the UK sector undergoes its rapid development and growth, there is a unique opportunity in the UK to revitalise our economy by changing the way we manage our waste, make use of recovered products and invest in the necessary infrastructure and jobs. In addition to recycling, a crucial tenet within this strategy is energy-from-waste as a valuable supply of green energy.

There is also significant potential to help reinvigorate the UK's manufacturing industry – by creating a 're-manufacturing' sector by reusing recyclables in the UK to manufacture new goods for sale.

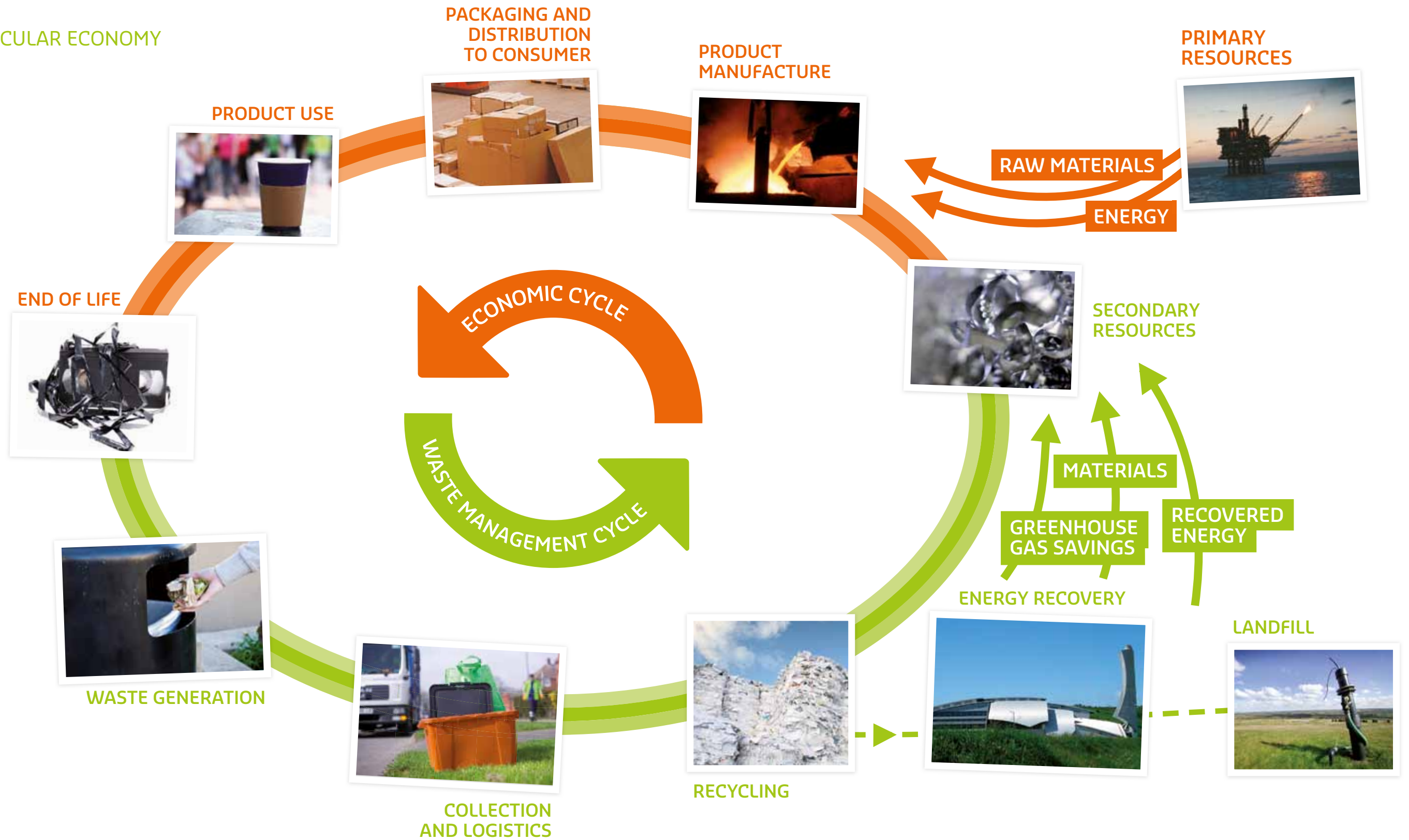
<sup>1</sup> State of the Nation: Waste and Resource Management 2011, ICE

<sup>2</sup> The potential for renewable gas in the UK, National Grid, January 2009 – with SITA UK recalculation to reference only waste based outputs.

<sup>3</sup> Key Social Impacts of Electronics Production and WEEE-Recycling in China, Öko-Institut e.V., June 2007

<sup>4</sup> Gone to Waste: The valuable resources that European countries bury and burn, Friends of the Earth Europe, 2009

## THE CIRCULAR ECONOMY





## THE UK WASTE MANAGEMENT SECTOR IN TRANSITION

Defra forecast in its 2011 Waste Policy Review that the waste and recycling sector, valued at around £11 billion (\$17.45 billion) per annum, will grow by between three and four per cent a year at least for the next few years, while a separate government report estimated that the sector will grow by 37 per cent in the decade to 2020. Job growth could be even higher – more than 50 per cent over the decade, according to Energy and Utility Skills, the sector's official skills council.

Caroline Spelman, Secretary of State for Environment, Food and Rural Affairs, said that in order to achieve its targets for a more efficient and vibrant sector, and to meet EU obligations, "Government cannot act alone and must work in partnership with local government, industry, civil society, consumers and communities." This will mean a mixture of policy - such as phasing out the Landfill Allowance Trading Scheme and increasing the landfill tax – as well as a wide range of initiatives aimed at rewarding good behaviour and helping the private sector, which accounts for the bulk of jobs growth, to innovate and develop.

The waste industry has been in a period of rapid transition, driven by a wide range of forces – including government policy – that are aimed at minimising waste and maximising the benefit that can be recovered from it. Those forces are also creating opportunities for growth in the sector. Employment in the waste sector has more than doubled since 2005 – to nearly 150,000 direct employees, according to the latest Labour Market Investigation by Energy and Utility Skills – even as the traditional refuse collection functions of the industry have consolidated.

The value of the UK waste management market is forecast to increase to £12 billion in 2012 (a nine per cent increase from the government's 2011 estimate, nearly double its value in 2005) as high levels of investment are required for new recycling and energy-from-waste facilities over the coming decade and beyond. Waste management companies will face increasing pressure to be more innovative and to develop a range of collection / sorting / separation / energy production systems, as well as alternative waste disposal options.

As government policy pushes further to change behaviour and reward recycling, and as industry and the public respond to that pressure, new job opportunities will increasingly come from areas requiring higher levels of skills – like design, repair and re-use – as well as from both building the new infrastructure and operating the new waste treatment facilities.

## BUILDING ON PROGRESS

The UK sector has already made great strides in terms of households and businesses becoming less wasteful. Over the past decade, waste going to landfill has nearly halved and household recycling rates have climbed to 40 per cent, waste generated by businesses declined by 29 per cent in the six years to 2009 and business recycling rates are above 50 per cent, according to government figures <sup>5</sup>.

A key driver has been government policy, especially the requirement to meet landfill targets under EU directives. In 2010, the UK Government broadened the definition of biodegradable municipal waste to capture more commercial and industrial waste and said it will be stricter on, for example, wood waste. It has proposed phasing out the Landfill Allowance Trading Scheme after 2012 / 2013 and will concentrate instead on increasing the landfill tax from £64 per tonne in 2012 / 2013 by £8 a year to £80 per tonne in 2014 / 2015. Incentives exist to encourage the use of waste based resources for the production of energy, but little exists for the re-use of valuable resources recovered from the waste stream.

<sup>5</sup> www.defra.gov.uk

## CASE STUDY ONE

As landfill declines, evolving technologies replace their energy output. Nearly 20 per cent of all UK renewable electricity supplied in 2010 was generated using landfill gas technologies that, since the 1970s, have enabled gas captured to provide reliable green electricity to the grid.

However, whilst waste policies discourage landfill use, new technologies are emerging to ensure waste, as a valuable source, is developed and productively used.

**Mitcham, Surrey:** London Mayor Boris Johnson gave his approval to extend and improve this existing SITA UK site in October 2011 to incorporate a new anaerobic digestion facility that will process around 40,000 tonnes of food waste each year, generating enough power for 1,800 homes. The current materials recycling facility will be extended to help process 80,000 tonnes a year of recyclables, while a waste transfer station and a brand new visitor centre will also be constructed.

**Charlton Lane, Shepperton:** Surrey County Council granted permission for the development of this Eco Park in March 2012, which will see the development of a 40,000 tonnes a year anaerobic digestion facility that will produce electricity from recycled food waste, and a 60,000 tonnes a year gasification facility that will produce energy from residual waste. A 45,000 tonnes a year bulking recycling facility will also be included.

### In 2011, SITA UK generated:

- + 536,686 megawatt hours of electricity from landfill gas.
- + 209,325 megawatt hours of electricity from energy-from-waste facilities.
- + A total of over 700,000 megawatt hours – the approximate electricity usage of around 160,000 homes.

## CASE STUDY TWO

In April 2011, SITA UK signed a 25-year Private Finance Initiative (PFI) contract with the South Tyne and Wear Waste Management Partnership to manage 190,000 tonnes of residual waste annually from the local authority areas of Gateshead, South Tyneside and Sunderland.

The contract includes the design, build, finance and operation of an energy-from-waste facility in Teesside with a capacity of up to 256,000 tonnes a year, which will generate electricity for up to 30,000 homes. In total, over 90 per cent of the contract waste managed by SITA UK will be diverted. The new facility will create 66 new permanent jobs and 300 additional jobs during the construction phase. It is expected that the facility will be operational in 2014. The contract also includes the development of three waste transfer stations and a visitor centre.



*Billingham, Teesside*



# THE POTENTIAL FOR WASTE TO RESOURCES

## KEY POINTS

- + Waste to resources brings several tens of millions of tonnes of valuable and useful secondary commodities to market, providing the potential to reduce virgin material imports and feed local manufacturing.
- + Every tonne of waste diverted from landfill has the potential to create additional skilled and semi-skilled jobs in the green economy.
- + By providing domestic outlets for the use of recovered and recycled materials rather than exporting them overseas, the benefits of job creation in the sector can be retained within the UK.

## THE CHALLENGE

By 'waste to resources' we mean investing in treatment infrastructure involving activities at the upper end of the waste hierarchy – re-use and recycling.

The UK has made great strides in the past decade in improving its recycling performance, largely due to the introduction of local authority recycling targets coupled with the landfill tax escalator which ramped up landfill tax to more quickly match non-landfill treatment costs, and the enactment of the Landfill Directive, which set targets for the diversion of biodegradable municipal waste from landfill.

However, our current rate of recycling – on average about 45 per cent across the municipal and commercial / industrial sectors – implies that a further 20 to 25 per cent, if not more, of materials such as paper, glass, metals and plastics is still ending up in UK landfills when they could conceivably be recovered from the waste stream if our collection systems were appropriately designed and if the market signals were more favourable. This represents many additional millions of tonnes of secondary materials that, if recovered from our landfilled waste, could be re-introduced back into the general economy, saving on virgin materials and creating waste treatment jobs in the process.

## JOB CREATION POTENTIAL

Every tonne of waste diverted from landfill into activities involving recycling or re-use has the capacity to generate additional jobs. This is because activities such as disassembly and dismantling (in the case of material re-use) and the manning of recycling facilities are generally more resource-intensive than managing a landfill. While estimates as to precisely how many additional jobs these activities can generate vary according to the sophistication of technology and the level of automation designed into these facilities, there is little doubt that the re-use and recycling sectors can create sustainable skilled and semi-skilled employment at facilities generally located within the local host communities. If, additionally, the recovered material can also be utilised in locally-sited production and manufacturing processes, added community benefits can accrue.

## Indicative job creation from re-use, recycling and conventional disposal of waste in the United States

Type of operation	Jobs per 10,000 tonnes processed per year
Product re-use	470
Recycling-based manufacturers	162
Conventional materials recovery facilities	15

Source: Adapted from *More jobs, less waste*, Friends of the Earth, September 2010

## Job gains from specific materials in the UK

Materials	Jobs gains per 1,000 tonnes
Plastics	15.6
Paper	3.5
Glass (mixed)	0.75
Glass (separated)	0.75
Green waste	1.3
WEEE	40
Furniture (non-WEEE)	13.6
Aluminium	11
Steel	5.4

Source: Adapted from *More jobs, less waste*, Friends of the Earth, September 2010

## RETAINING GREEN GROWTH WITHIN THE UK

Though we cannot expect all of the UK's waste product to be recycled for use domestically, there is enormous potential to grow businesses aimed at import substitution. Consider, for example, the following <sup>6</sup>:

- + At least 4.2 million tonnes of paper and card were exported in 2010 and yet at the same time we imported 7.7 million tonnes of paper and paper articles.
- + At least two million tonnes of plastics could be recycled, with around 790,000 tonnes being exported and in excess of one million tonnes being placed in landfill each year. The UK imported around 3.3 million tonnes of plastic and plastic products in 2010.
- + More than 500,000 tonnes a year of glass could be recycled and around 210,000 tonnes a year is exported.
- + Around 7.21 million tonnes of ferrous metals and 330,000 tonnes of aluminium were exported in 2010. In the same year, we imported around 1.4 million tonnes of iron and steel based products.

Making or recovering these raw products and the others (such as rare earth materials and metals) domestically will become increasingly more important. Government has estimated that action by business and policy makers on materials such as cobalt and lithium could reduce the UK reliance on imports of these vital rare earth minerals by between 20 and 30 per cent. The jobs and economic activity that would arise if dismantling of equipment, resource recovery and re-use was established in the UK would be a significant boost to the UK economy.

<sup>6</sup> Government Review of Waste Policy in England, Defra, 2011



# THE POTENTIAL FOR ENERGY FROM WASTE

## KEY POINTS

- + The government estimates that waste-derived renewable electricity from thermal combustion alone could triple by 2020 to 3.6 terawatt hours, enough to power one million homes.
- + Studies estimate that energy-from-waste has the potential to meet between 11 to 15 per cent of the UK's commitment to generate 30 per cent of electricity from renewable sources, and that over a third of the country's residential gas demand (up to 12 per cent of total UK demand) <sup>7</sup> could be met by energy-from-waste technologies.
- + Industry could reach these top end targets with greater or more focussed support for Government's incentive mechanisms for waste-derived energy capacity and for related heat projects.

## FILLING THE ENERGY GAP

After landfill, energy-from-waste accounts for the largest amount of residual waste disposed of in the UK.

Today there are 30 energy-from-waste facilities around the UK, varying in size from more than 500,000 tonnes a year down to 60,000 tonnes. To meet its targets the UK would need a further 80 facilities of varying size by 2020. Current trends suggest that the very large facilities are being located in historically industrial areas of the country – such as Teesside, Manchester / Liverpool and Bristol / Avonmouth – with medium-size and smaller facilities being located nearer the source of the waste.

As landfill disposal is discouraged, the growth of anaerobic digestion facilities, which use processes to break down food and other biodegradable materials and convert the resulting gases to energy or fertilizer, will be another driver for the sector. According to Waste and Resources Action Programme (WRAP) – a government-sponsored agency that fosters more efficient waste disposal for business and industry – there was an increase in the number of anaerobic digestion facilities operating on mainly waste inputs, from an estimated 17 in 2009 to over 44 in 2011 <sup>8</sup>.

Anaerobic digestion facilities vary from the very small (less than 5,000 tonnes per year) up to the larger facilities that are around 150,000 tonnes a year. Anaerobic digestion has seen significant growth (>250 per cent in capacity) in two to three years and by 2020 will likely have grown ten-fold from 2009/10 capacities. The technology mix is very difficult to predict as they are strongly influenced by government incentives, their ability to gain funding and the planning process.

Given the current state of knowledge, we estimate that:

- + Energy-from-waste (moving grate and fluidised bed) capacities are likely to represent 60 to 80 per cent of that required (15 to 25 million tonnes feedstock capacity) by 2020.
- + Gasification is likely to meet 20 to 40 per cent of the total required capacity (five to 10 million tonnes feedstock capacity) by 2020.
- + Liquid fuels will contribute through facilities such as at the SITA UK end-of-life plastic to diesel facilities (10 announced using end-of-life plastic to produce in excess of 45 million litres of diesel and 12 million litres of kerosene) and INEOS Bio plant in Teesside which is likely to produce in excess of 30 million litres of ethanol.
- + Landfill gas-to-energy will decline by 30 per cent in the decade to 2020. This reflects the continuing decline in biological waste to landfill and the natural decline in landfill gas production over time.

If these energy trends are borne out, then by 2020 energy-from-waste could account for more than 15 per cent of all the electricity capacity in the market, assuming it is not directed to liquid fuels or the gas grid. To achieve the infrastructure necessary to continue, the transformation of the industry will require between £15 billion and £25 billion of investment.

## HOW GREAT IS THE ENERGY FROM WASTE POTENTIAL?

The government recently estimated that waste-derived renewable electricity from thermal combustion alone could triple by 2020, to 3.6 terawatt hours <sup>9</sup>, which would be enough to supply about one million homes with electricity – and that does not include the potential energy generated from anaerobic digestion or a host of other potential energy projects. A previous study, in 2005, concluded that up to 17 per cent of all the UK electrical energy demand could be met from residual waste. That could be enough to meet as much as 40 per cent of the government's target to generate 30 per cent of the UK's electricity from renewable sources. Cranfield University, more recently, was even more optimistic, arguing that energy-from-waste technologies could contribute as much as 15 per cent of the UK's renewable electricity target by 2020 if given sufficient support.

The government estimates that anaerobic digestion (using food waste and manure) has the potential to supply up to 3.5 terawatt hours <sup>10</sup> of electricity by 2020, enough to supply nearly one million homes while saving 1.8 million tonnes of CO<sub>2</sub> equivalent in emissions. In addition they can be a useful source of low carbon fertilizer, reducing the need for imported materials and potentially offsetting 386,000 tonnes of carbon dioxide equivalent in greenhouse gas emissions.

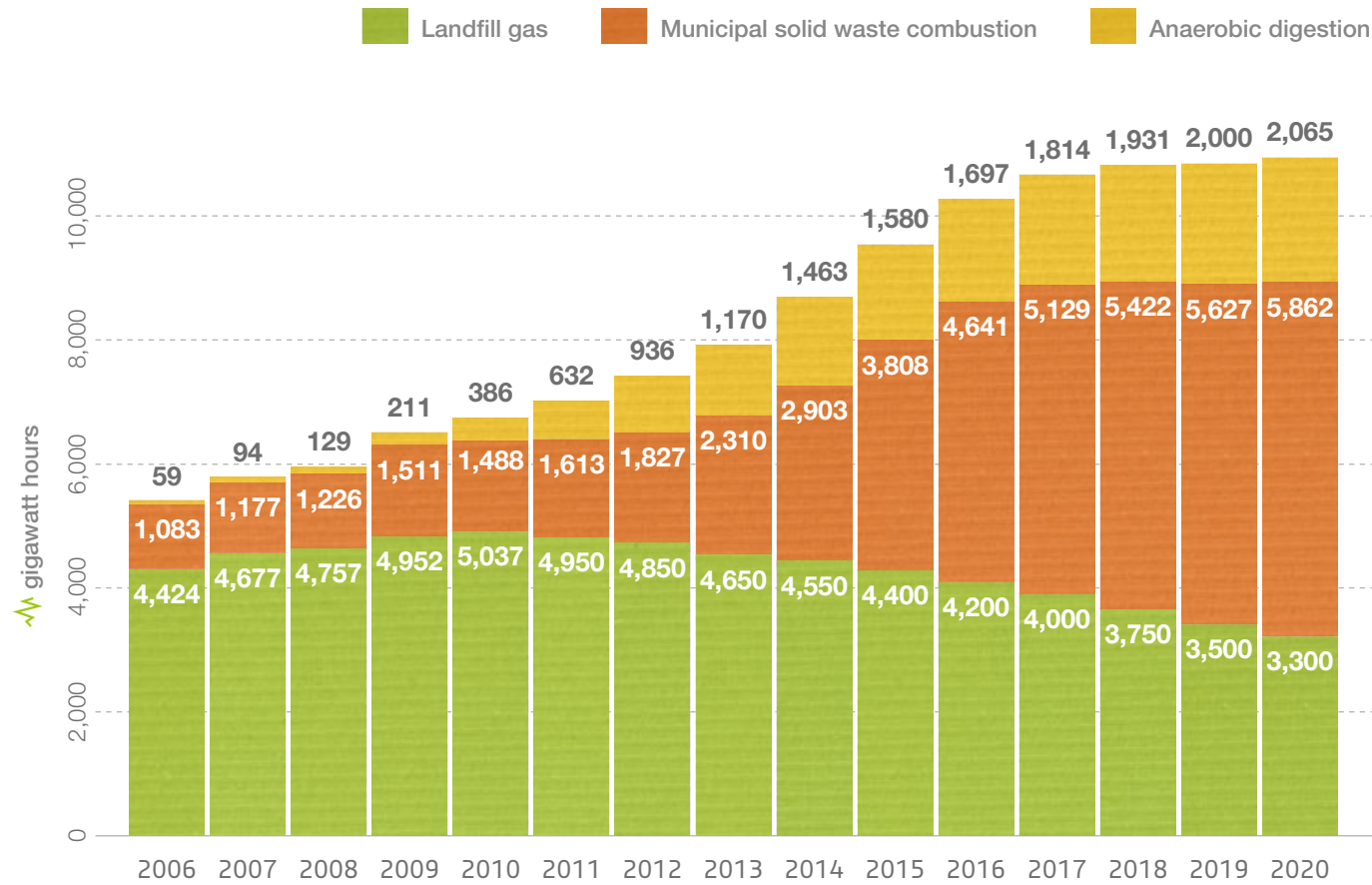
<sup>7</sup> The potential for renewable gas in the UK, National Grid, January 2009 – with SITA UK recalculation to reference only waste based outputs.

<sup>8</sup> Anaerobic digestion infrastructure in the UK: September 2011, WRAP

<sup>9</sup> Government Review of Waste Policy in England 2011, Defra  
<sup>10</sup> Government Review of Waste Policy in England 2011, Defra



## POTENTIAL ENERGY DERIVED FROM WASTE



Waste materials have tremendous versatility in energy. They can be burned to generate electricity or to provide heat directly, they can produce gas for injection into the gas grid, or they can be refined into liquid fuels – such as ethanol – to power vehicles, as well as other uses such as renewable industrial chemicals. Over the years, a mixture of different market mechanisms and stimuli have been put in place to support and promote these activities, from the original Non-Fossil Fuel Obligation contracts to the Renewables Obligation, Renewable Transport Fuel Obligation, Feed-in Tariffs, and most recently the phased introduction of the Renewable Heat Incentive.

However, to deliver the full potential of green energy generated from waste, the government will need to recognise the commercial realities and risks of the different technologies and promote the development of a portfolio of technologies that provide a balance of large and small facilities, and low and higher risk technologies, developed in the right locations. Current uncertainties on the Renewables Obligation banding review and lack of Renewables Transport Fuel Obligation targets beyond 2014 are influencing and impairing investment decisions today.

## LOST OPPORTUNITIES

Growth has been limited, though, by uncertainty and inconsistency in the incentive levels, difficulties in getting planning permission, and more recently tumultuous uncertainty in the financial markets that make funding projects difficult. Currently, there is less than six million tonnes of energy-from-waste capacity in the UK (municipal solid waste, and commercial and industrial waste), compared to an estimated requirement of at least 20 million tonnes of capacity by 2020 to deal with the residual waste diverted from landfill. This shortfall has driven out energy-from-waste business to other European countries. It is a missed opportunity, especially considering the volume of installed coal and nuclear capacity that is due to come off-line over the next decade.

Technologies for the recovery of energy from waste vary from the traditional and well-proven moving grate combustion systems (incineration) – which generate heat directly as well as steam to create electricity – to the more recent gasification, pyrolysis (a process creating charcoal), anaerobic digestion or fermentation technologies. Scales for these facilities vary from a few tens of thousands of tonnes treated per year through to many hundreds of thousands of tonnes and there is a need for both large regional-scale facilities and smaller local community-scale projects.

Generating electricity from waste also produces residual heat. Incentives to support this green heat source should be a major focus of the incentives. In other European countries, the use of heat from energy-from-waste facilities is common and technically proven. Yet the lack of proportional incentives and heat grid base infrastructure or secure methods of funding and delivering new heat grids, as well as planning permission hold-ups and relatively high costs in the UK, mean that it remains the exception rather than the rule. So, heat from energy-from-waste is not realising anywhere near its full potential to help meet the UK's renewable heat target of 11 per cent from renewable sources by 2020.

An essential first step to address the situation would be for the government to ensure Renewable Heat Incentive support for the green heat energy from landfill gas. This would support the development of local heat grids from existing renewable heat sources and make use of any existing developed source of renewable heat. The Renewable Energy Association, which represents the renewable energy industry in the UK, recently estimated that more than six terawatt hours of usable renewable heat could be generated from landfill gas in the UK.

## WHAT A WASTE

The UK's recycling efforts have made massive inroads into reducing our reliance on landfill. However, despite this we still need to deal with a considerable volume of material that cannot be viably recycled or reused. This residual waste often contains between 35 and 75 per cent renewable materials. This proportion of renewable feedstock may well increase if some of the fossil components (such as plastic) are diverted to other uses, such as SITA UK's project to convert end-of-life plastics into market-grade diesel.



## CASE STUDY THREE

After gaining permission for over 1.5 million tonnes worth of treatment capacity since July 2011, SITA UK continues to play a leading role in delivering facilities that will help increase recycling capacity and divert waste from landfill in the UK.

With around 48 per cent of the UK's waste still sent to landfill each year, new recycling and energy recovery facilities are desperately needed to help the UK catch up with European neighbours and achieve ambitious recycling targets. The prospect of delivering more than 1.5 million tonnes worth of new treatment facilities that will help improve the quantity and quality of recycled materials pulled from the waste stream, to generate heat and power from waste and even to create diesel from end-of-life plastics is encouraging.

**Binn Farm, Perthshire:** A gasification facility capable of processing around 60,000 tonnes of residual waste per annum was given the go-ahead at Binn Farm, near Glenfarg, in October 2011. The facility will produce enough electricity to power 8,000 homes.

**Great Blakenham, Suffolk:** Approval was granted in July 2011 for this 269,000 tonnes a year energy-from-waste facility that will deal with all of Suffolk's non-recycled household waste for the next 25 years. It will produce enough energy to power 30,000 homes from waste that would otherwise go to landfill, helping to save the Council around £350 million.

**Ridham, Sittingbourne:** Kent County Council approved plans for a 100,000 tonnes a year refuse-derived fuel facility, a 75,000 tonnes a year wood recycling facility and a 25,000 tonnes a year materials recycling facility for this site in September 2011.

**Landor Street, Birmingham:** Planning permission was granted for a 120,000 tonnes a year refuse derived fuel facility, 50,000 tonnes a year materials recovery facility and 30,000 tonnes a year waste transfer station at this new site in central Birmingham in November 2011.



*Great Blakenham, Suffolk*

# THE POTENTIAL FOR GROWTH AND EMPLOYMENT

## KEY POINTS

- + The waste management sector could attract between £20 billion and £25 billion of investment in new waste management infrastructure over the next decade.
- + Investment in new infrastructure would create from 19,000 to as many as 36,000 new jobs directly, with a further 25,000 to 48,000<sup>11</sup> new jobs created indirectly throughout the UK, by 2020.
- + Many of the new jobs will require advanced skills, for example for designers and skilled operators.

## GROWING THE GREEN ECONOMY

While the UK has achieved much in the past decade in diverting waste away from landfill and into alternative recycling and recovery facilities, we still landfill nearly half of the commercial, industrial and municipal waste we produce, without prior treatment. Within this waste are many millions of tonnes of potentially reusable secondary raw materials and energy-containing materials which are lost to the general economy and whose place in manufacturing and production processes is taken by virgin materials (often imported) and fossil-powered energy. Maximising the diversion of this waste and putting it to beneficial use by re-introducing recovered materials and energy into the general economy is the rationale behind the concept of the circular economy.

<sup>11</sup> Indirect jobs calculated using various references including multiples referenced by the Scottish Government (Short to medium term material recycling facility requirements in Scotland, Caledonian Environment Centre, 2009)

<sup>12</sup> For indirect jobs the multipliers applied have been taken from the most appropriate or nearest reference for each activity based on studies from Ernst and Young – 2006, USEPA multistate study 2002, ADAS 2003, Mackay Consultants 2007 and Scottish Executive 2009.

### In 2009/2010, SITA UK constructed a model of waste arisings in the UK, considering:

- + Recycling targets and improved performance.
- + Waste prevention measures have led to a reduction in waste arisings per head of population of 23 per cent by 2030.
- + Population growth allied to a larger source of waste.
- + Historic trends for forward projection of waste composition and arisings.

We then estimated the likely additional treatment capacities required by 2020 for the main categories of treatment, using 2009/10 treatment capacities as a baseline.

### We estimate that by 2020 the UK will require additional treatment capacity of:

- + 25 to 35 million tonnes for energy-from-waste combustion.
- + 15 to 16 million tonnes for material recycling facilities.
- + 10 to 16 million tonnes for organic treatment (composting and anaerobic digestion).
- + 10 million tonnes for other forms of treatment (for example, of metals, batteries, waste electrical and electronic equipment, etc).

Landfill tonnages will be expected to continue to decline as landfill tax rises, alternative treatment facilities are developed and become available, and resource recovery and waste minimisation become better practised. Landfill active waste tonnages are likely to have fallen from over 40 million tonnes in 2006/7 to less than 25 million tonnes in 2010/11 and are projected to be less than 10 million tonnes per year by 2020.

## CREATING GREEN EMPLOYMENT

With the investment in these new facilities comes new opportunities for job creation. The government's waste sector review last year recognised that it is difficult to be sure how the jobs picture will unfold as some areas decline and are replaced by others. Recycling and quality improvement operations are generally more labour-intensive than traditional disposal operations and more of the jobs created will skew towards businesses deploying complex technological solutions to waste management and resource production problems. The experience at SITA UK has been that there are new and varied career opportunities for young and experienced people with a wide variety of backgrounds.

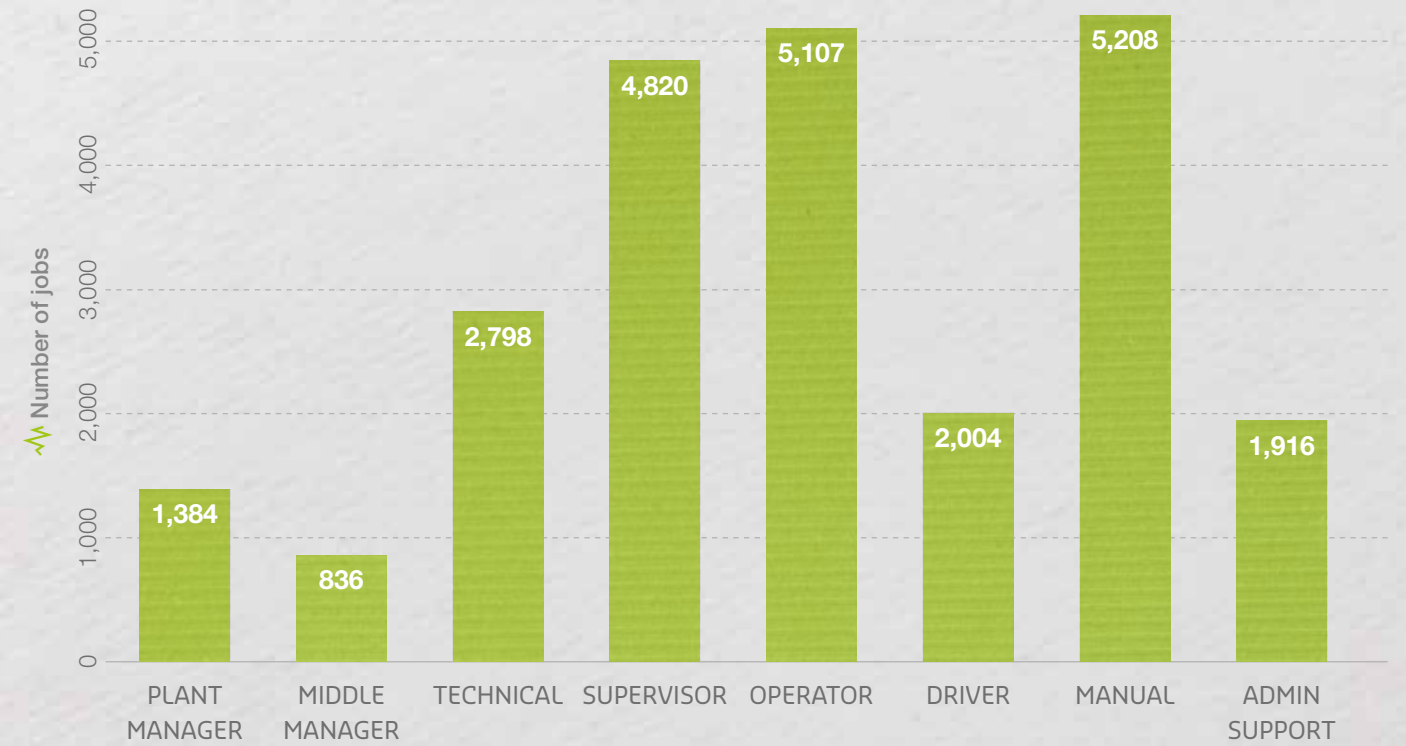
Based on staffing levels typical of the sector or its nearest equivalent sector and using appropriate multipliers to estimate the number of indirect and induced jobs in proportion to the number of direct jobs, SITA UK has estimated the new employment opportunities in the sector<sup>12</sup>.



Potential jobs by treatment type

Treatment type	Number of direct jobs	Number of indirect jobs
Energy-from-waste	4,800 – 5,500	6,500 – 7,500
Materials recycling facilities	7,500 – 12,000	9,000 – 16,000
Organic treatment <sup>13</sup>	4,000 – 6,000	6,000 – 8,000
Niche, specialist, dismantling etc	3,000 – 12,500	3,500 – 16,500
<b>Total</b>	<b>19,000 – 36,000</b>	<b>25,000 – 48,000</b>

Potential direct jobs by type



“We’ve been setting up a brand new facility in the highly competitive London metals market. I had to source and negotiate metals from the travelling community to Chief Executives. It was very exciting and great when we achieved our aim of filling the shed. SITA UK’s graduate training programme has connected my degree knowledge to real life, on-site thinking and developing my skills.”

– Dany Drummond,  
Graduate Trainee Trading Manager  
SITA UK’s metals recycling facility, Hayes, Middlesex



<sup>13</sup> A study of the UK organics recycling industry 2009, WRAP – states minimum of 2,325 directly employed on site facilities.

## WHAT GOVERNMENT CAN DO

The waste management sector has already evolved radically from one that was primarily concerned with disposal to one that can make a significant contribution to the UK on a number of strategically important fronts. The UK waste to resources and energy-from-waste sectors are developing rapidly and are predicted to continue to grow through 2020 and beyond.

The sector can help to achieve greater energy security and to meet clean energy and greenhouse gas emissions-reduction goals by promoting energy-from-waste innovation, an area that already accounts for a significant portion of UK energy generation. It can recycle and repurpose valuable materials from waste to resource technologies that can be used in manufacturing industries in this country – promoting not only more employment and a stronger manufacturing base, but also the potential to redress the current balance of trade through the export of more products and substitution of currently imported raw materials. It can also help to create new jobs at a faster rate than the economy is growing and many of these will be in areas where advanced skills are required to help further innovate.

To achieve its absolute potential from an industry that is well financed with significant private funds waiting to be unlocked, we must continue to partner with Government and build on existing initiatives to help get projects off the ground. Just as importantly, we also need the support of the wider public for the development of an industry that is an innovator of a whole range of frontier technologies, that provides exciting prospects for investment and jobs, and one that helps to address some of the essential energy and environment challenges that the country – and the world – faces in this century.

## RECOMMENDATIONS FOR FUTURE ACTION

To make this a reality, Government needs to provide sufficient visibility, opportunity and targeted incentives to ensure that market conditions are favourable towards the use of recovered materials and energy in preference to primary sources, and in particular towards the promotion of UK-based development.

### Recommendation one

Government should view the waste management sector as part and parcel of the broader economic base of the UK. In developing green growth strategies for the UK, Government should plan for the optimal utilisation of the materials and energy outputs of waste management processes by production and manufacturing activities within the general economy, and by local communities. In practice this will require a radical rethink of the criteria applied to waste management planning and to the siting of waste management facilities.

### Recommendation two

We have highlighted in this report the employment opportunities and environmental gains that are lost to the UK when recovered materials and (indirectly) energy are exported overseas. To secure these benefits for the UK, Government needs to support the development of an appropriate industrial infrastructure in the UK, in order to internalise within domestic manufacturing and production processes the materials we are currently exporting due to lack of UK industrial capacity. In energy, for instance, this means ensuring that it is commercially attractive to develop and build energy recovery facilities in this country, which are sited so that both heat and power generated by the facility can be utilised.

### Recommendation three

For resource re-use in the UK, Government must create market signals that encourage manufacturing to establish in the UK and give them the confidence that the source of raw materials will be maintained and secured. Policy instruments need to ensure that each commodity is encouraged to be used for the most sustainable resource or energy activity. These instruments must create a stable long-term investment environment to allow business to make a viable and defensible business case and secure the many billions of pounds of investment that are required to make this opportunity a reality.

### Recommendation four

There is a strong indication that appropriate community buy-in models – the use of community funds and the use of personal incentives, such as utility discounts – encourage the public to be more accepting of waste management infrastructure. We urge local authorities to engage the community on the detail of community buy-in at the early stage of the consultation process about waste plans. Starting a conversation within the community at the earliest stages of planning before proposals are brought forward from competing providers is clearly the most effective approach to engagement and long-term approval.

## ABOUT SITA UK

SITA UK is a recycling and resource management company serving households, local authorities and a wide range of companies and organisations.

We have been in the UK since 1988 and have grown steadily, becoming a leader in our sector with a network of facilities throughout the country. SITA UK offers a wide range of services and advanced technologies – from in-vessel composting to power generation. We operate to the highest environmental standards.

Our purpose is to protect our environment by putting waste to good use.

Over 12 million people and more than 40,000 businesses benefit from our knowledge and experience in managing recycling and waste. We have behind us the expertise and resources of SUEZ ENVIRONNEMENT, a global provider of essential environmental services.



SITA UK, SITA House, Grenfell Road  
Maidenhead, Berkshire SL6 1ES

[WWW.SITA.CO.UK](http://WWW.SITA.CO.UK)



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