

AmeyCespa (East) Ltd

The economic impacts of a new energy from waste facility



Final Report

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Cambridge Econometrics
Cambridge, UK

jd@camecon.com
www.camecon.com

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2.0	21/03/19	Jon Stenning	Final report with client comments addressed, plus executive summary
3.0	27/03/19	Jon Stenning	Final report with further client comments addressed

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Executive Summary

AmeyCespa (East) Ltd commissioned Cambridge Econometrics to model the potential economic impacts of constructing, operating and maintaining a new energy from waste facility at their existing waste management park in Waterbeach, Cambridgeshire. The analysis also considered the economic impacts of the ongoing operation and maintenance of the existing waste management park.

This analysis considered the following measures of economic impact:

- Direct and indirect gross output - total economic activity in the production of new goods and services (measured in £m) at the site and through supply chains to the site
- Direct and indirect gross value added (GVA) – the value of goods and services that have been produced at the site and through supply chains to the site, minus the cost of all inputs and raw materials that are directly attributable to that production (measured in £m)
- Direct and indirect employment at the site and through supply chains to the site

An Input-Output (IO) modelling approach, using an IO table, was used to estimate these measures of economic impact. An IO table measures the (historical) purchases of goods and services from each industry within the economy, capturing supply chain links, and therefore allowing us to determine how an initial investment in a particular sector trickles down as greater expenditure (and therefore increased output) in associated supply chain sectors. It is then possible to quantify the total economic output of the initial investment, across all sectors of the economy.

In summary the results of the IO modelling approach show;

- The construction of the energy from waste facility is estimated to create up to 876 jobs in total within the South Cambridgeshire area (direct plus indirect jobs).
- In addition, the construction of the energy from waste facility could generate up to £45m in additional GVA within the local area.
- The ongoing operation and maintenance of the energy from waste facility is estimated to create around 48 additional jobs for the local area in total, and generate an additional £2.7m in GVA annually.
- These new jobs will be in addition to the 428 jobs (including direct and indirect jobs) that are estimated to exist locally because of the ongoing operation and maintenance of the existing waste management park. Furthermore, the additional GVA created by the energy from waste facility will be in addition to the estimated £27m of GVA already generated annually by the existing waste management park (including both direct and indirect GVA).

1 Introduction

AmeyCespa (East) Ltd (hereafter referred to as ‘Amey’) commissioned Cambridge Econometrics (CE) to model the potential economic impacts of constructing, operating and maintaining a new energy from waste facility at Amey’s existing waste management park in Waterbeach, Cambridgeshire. The analysis also considered the economic impacts of the ongoing operation and maintenance of the existing waste management park. This brief report summarises the results of the analysis.

1.1 Glossary

A number of technical terms are used throughout the report, and their meaning is set out in detail in the table below.

Term	Definition
Direct economic impacts	Direct impacts economic impacts, such as changes in output or employment, occur within the sectors where the initial investment is made. The impacts are a direct result of the initial investment.
Indirect economic impacts	Indirect impacts occur as a result of increased business-to-business activity along the supply chain associated with the sector that originally received the investment/ expenditure.
Induced economic impacts	Induced economic impacts occur as a result of increased personal incomes that result from the direct and indirect impacts. As employment increases and household incomes increase, so too does household consumption of other goods and services.
(Gross) output	Total economic activity in the production of new goods and services (measured in £m).
Gross value added (GVA)	The value for the of goods and services that have been produced, minus the cost of all inputs and raw materials that are directly attributable to that production (measured in £m)
Labour productivity	A ratio between the volume of output that is produced and the number of employees.

2 How the analysis was carried out

2.1 Introduction

The key economic impacts of the potential energy from waste facility and existing waste management park were evaluated based upon inputs provided by Amey, and the use of an approach based upon an input-output, to measure both the direct (activity created on site) and indirect (activity created through supply chains to the site) impacts from the site. Further, induced effects (as defined in Section 1.1) of the construction and operation and maintenance of the site are not included in this analysis.

Specifically, in this analysis we considered the following measures of economic impact:

- Direct and indirect gross output
- Direct and indirect gross value added (GVA)
- Direct and indirect employment

2.2 Input-output approach

An input-output (IO) table measures the (historical) purchases of goods and services from each industry within the economy, capturing supply chain links. An initial investment or expenditure creates output in specific sectors, and the IO table is used to quantify the increase in purchases of goods and services required to deliver that output, and consequently additional impacts further up the supply chain. CE used an in-house spreadsheet-based tool, which uses a UK-level IO table (i.e. captures UK-level supply chain relationships between sectors), to estimate the economic impact of constructing the energy from waste facility and from operating and maintaining the energy from waste and waste management park facilities.

For this analysis, we assessed three sets of economic impacts, each discussed in the following subsections.

The impacts of constructing the new energy from waste facility

First, the impact of the construction of the new energy from waste facility was estimated. The construction costs of the new facility were introduced as additional expenditure in two sectors within the IO tool (see Table 1). The costs were spread over a 36-month period, with 87.5% of the construction costs spread equally in the first 30 months of the construction period, and the remaining 12.5% of the costs spread evenly across the final 6 months of the construction phase.

Table 1: Energy from waste facility estimated construction costs

IO tool sector	Investment (£m)
Construction	160
Architectural and engineering services; technical testing and analysis services	40
Total construction cost:	200

Source: Amey.

The IO tool was applied to estimate the average annual direct increase in value added and employment in the relevant sectors that is created during each year of construction of the facility, and the additional value added and employment that is created through associated supply chains (i.e. the indirect impacts) over the same period. The results are presented in this way because the investment is spread out over time – so value added/ jobs are created only as specific investment is made in the site, and only for as long as that investment lasts.

Employment is calculated through the model via existing coefficients that describe the relationship between output and employment in each sector. These relationships are based upon official national statistics for historical employment and output in each sector. The coefficients state how much employment is expected to be generated from one additional unit of output. In the IO tool, the new construction expenditure creates additional output both directly in initial investment sectors, and indirectly in associated supply chain sectors. This increase in output is combined with the sector-level coefficients to produce estimates of job creation. A limitation of this approach to estimating employment is that it is based on national-level, sectoral data, which does not take in to account local or more detailed industry features.

Impact of continued operation and maintenance of the energy from waste facility

Second, the economic impacts of the continued operation and maintenance of the new energy from waste facility were calculated. This was based upon estimates of employment in O&M at the new facility, provided by Amey, which formed the input to the IO tool (see Table 2). Both the direct and the indirect impacts on average annual value added and employment created during the operational lifetime of the plant were measured. Assumptions about labour productivity (used to calculate the impact on GVA and output), were based on UK-wide industry averages.

Note that, since the site is in continual operation, the GVA and total employment calculated in this analysis represent the value that is in place at any given year. For example, for as long as the plant is in operation, 32 direct jobs will be in place at the site. These value added and jobs measures are not time-limited in the same way that the estimates from the construction phase are.

Table 2: Estimated employment from the operation and maintenance of new energy from waste facility

IO tool sector	Employment (no. of FTE jobs)
Other professional services	7
Office administrative services	2
Architectural and engineering services; technical testing and analysis services	6
Waste collection, treatment and disposal services	17
Total employment:	32

Source: Amey.

Impact of the operation and maintenance of the waste management park

The economic impact of the operation and maintenance of the existing waste management park¹ was also estimated using the same approach, using current employment figures provided by Amey (see Table 3).

Table 3: Existing employment from the operation and maintenance of waste management park

IO tool sector	Employment (no. of FTE jobs)
Waste collection, treatment and disposal services, including on/offsite staff	230
Office administrative services	40
Total employment:	270

Source: Amey.

Two different scenarios were then constructed;

- Scenario 1 – estimated economic impacts of the construction, operation and maintenance of the new energy from waste facility only
- Scenario 2 – estimated economic impacts of the construction of the new energy from waste facility plus the operation and maintenance of the new energy from waste facility and existing waste management park

The IO framework does not make any assumption about how much of the indirect economic activity that is generated will be within the local area (i.e. South Cambridgeshire region). We applied further coefficients to isolate the local impacts. Our approach assumes that the share of local demand satisfied by local production in each sector matches general national-level shares of UK demand satisfied by domestic UK production. This approach allows an assessment of how much value added and employment could be created locally in South Cambridgeshire, as preferred to created across the UK as a whole.

¹ The operation and maintenance of the existing waste management park also includes the operation and maintenance of associated off-site facilities, such as household waste recycling centres, and the employment of off-site drivers.

3 Findings

3.1 Scenario 1 - estimated economic impacts of the construction, operation and maintenance of the new energy from waste facility

Table 4 presents the total UK-wide economic impacts of both the construction and the ongoing operation and maintenance of the new energy from waste facility.

The construction of the new facility, and the accompanying £200m investment, is expected to generate a total impact (direct plus indirect impact) of almost £126m output, £55m GVA and over 1,000 additional jobs per year during the construction phase. The indirect impacts experienced along the associated supply chains account for over 40% of the total impact.

The Construction sector benefits the most from the installation of the energy from waste facility (in terms of increased output, value added and employment), followed by Architectural and Engineering Services. These are the two sectors that the initial investment is split between (see Table 1). Sectors which also benefit indirectly through supply chain effects include those closely connected to new construction activities, including Financial Services, the manufacture and provision of Cement, Lime and Plaster and Fabricated Metal Products.

The operation and maintenance of the new energy from waste facility is estimated to create 56 jobs in total, and generate a total impact (direct plus indirect impact) of £6.8m and £3.2m of output and GVA respectively. The indirect impacts that are captured through supply chains account for over 40% of the total impacts in all cases.

Table 4: Total UK-wide economic impacts

	Construction of energy from waste facility		Operation & maintenance of energy from waste facility	
	Direct impact	Indirect impact	Direct impact	Indirect impact
Gross output (£m)	70.0	55.7	4.0	2.8
GVA (£m)	30.0	25.2	1.8	1.4
Employment (FTE)	597.5	463.5	32.0	24.3

Source: Cambridge Econometrics.

Table 5 presents the total economic impacts specifically expected to occur in South Cambridgeshire from both the construction and the ongoing operation and maintenance of the new energy from waste facility. The total impacts from the construction phase are an increase in output of around £100m, a £45m increase in GVA and the creation of 875 new jobs per year of construction; whilst the operation and maintenance of the new facility is expected to bring £5.7m in additional gross output, almost £3m in additional GVA and 47 additional jobs for every year that the site continues to operate.

The direct impacts do not vary from the UK-wide impacts as they are (by definition) created at local level. While the results show that not all of the

indirect impacts are captured locally, around 50-60% of the total UK-wide indirect impacts of constructing the new facility are captured in the local area, while over 60% of the indirect impacts from the operation and maintenance of the new facility benefit the local area.

Table 5: Total local economic impacts

	Construction of energy from waste facility		Operation & maintenance of energy from waste facility	
	Direct impact	Indirect impact	Direct impact	Indirect impact
Gross output (£m)	70.0	30.8	4.0	1.7
GVA (£m)	30.0	15.0	1.8	0.9
Employment (FTE)	597.5	278.6	32.0	15.7

Source: Cambridge Econometrics.

3.2 Scenario 2 - estimated economic impacts of the construction of the new energy from waste facility plus the operation and maintenance of the new energy from waste facility and existing waste management park

Scenario 2 looks at the additional economic benefits of the operation and maintenance of the existing waste management park² alongside the economic impacts of the construction and the operation and maintenance of the new energy from waste facility (see Scenario 1).

Table 6 presents the total UK-wide economic impacts of both the construction of the energy from waste facility and the ongoing operation and maintenance of the entire waste park (i.e. the waste management and energy from waste facilities). The operation and maintenance of the existing waste management park is expected to generate in total approximately £72m in gross output, £33m in GVA and 518 jobs per year, over and above those created by the construction and operation and maintenance of the energy from waste facility (Scenario 1). The direct and indirect impacts of GVA and employment from the operation and management of the waste management park are very similar in magnitude (i.e. the total effect is split almost 50/50 between the direct and supply chain effects).

Within the associated supply chain sectors, the largest indirect employment impacts from the operation and maintenance of waste management park occur in Land Transport Services. This can be explained by the demand for transportation services for delivering materials to/from the site and other activities from managing and operating the waste management park and by staff travelling to work at the site. Other sectors that benefit through supply chain effects from the operation and management activities include Rental & Leasing Services and Financial Services.

² See footnote 1.

Table 6: Total UK-wide economic impacts

	Construction of energy from waste facility		Operation & maintenance of energy from waste facility		Operation & maintenance of waste management park	
	Direct impact	Indirect impact	Direct impact	Indirect impact	Direct impact	Indirect impact
Gross output (£m)	70.0	55.7	4.0	2.8	41.0	30.6
GVA (£m)	30.0	25.2	1.8	1.4	17.9	15.1
Employment (FTE)	597.5	463.5	32.0	24.3	270.0	248.0

Source: Cambridge Econometrics.

Table 7 presents the total economic impacts in South Cambridgeshire of both the construction of the energy from waste facility and the ongoing operation and maintenance of the entire waste park (i.e. the waste management and energy from waste facilities). This additional operations and maintenance of the existing site creates an additional £59m output, £27m GVA and 427 jobs per year on average compared to Scenario 1. Around 60%-65% of the total indirect impacts of the operation and maintenance of the waste management park are felt in the local South Cambridgeshire area.

Table 7: Total local economic impacts

	Construction of energy from waste facility		Operation & maintenance of energy from waste facility		Operation & maintenance of waste management park	
	Direct impact	Indirect impact	Direct impact	Indirect impact	Direct impact	Indirect impact
Gross output (£m)	70.0	30.8	4.0	1.7	41.0	18.0
GVA (£m)	30.0	15	1.8	0.9	17.9	9.3
Employment (FTE)	597.5	278	32.0	15.7	270.0	157.5

Source: Cambridge Econometrics.

Note that, in Table 4 - Table 7, the economic impact of the construction and operation & maintenance phases of the new energy from waste facility will never exist side by side. During the construction phase for the new facility, the estimated impact of this work will be seen as estimated in the analysis; but once construction has finished, these jobs will disappear (since no more investment is taking place), and instead the jobs associated with operations & maintenance of the facility will be created. For example, at a UK level, 1,578 jobs will be filled (directly and indirectly) at the site per year during the construction of the energy from waste facility (1,060 from the construction activity and supply chains and 518 from the operations & maintenance of the rest of the site), while once construction is completed total employment related to the site (all related to the direct and indirect impacts of operations & maintenance of both the new and old facilities) will be 574 (see Table 6).