

planning
transport
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Document 3.1 – ES Volume 2

Appendix 6.3: Practical effect of the K3 Proposed Development Carbon Assessment

Wheelabrator Kemsley (K3 Generating Station) and Wheelabrator Kemsley North
(WKN) Waste to Energy Facility DCO

September 2019 -Submission Version

PINS ref: EN010083



Addendum to Carbon Assessment Report for the Kemsley K3 WtE CHP Facility, Sittingbourne, Kent

This addendum provides further information about construction and operation of K3 as a whole, as required by the Planning Inspectorate (PINS) for the revised DCO application. The first point is to report the carbon impacts associated with the construction of the K3 WtE CHP Facility; the second point is the presentation of the carbon impacts of a baseline scenario modelling 657 kt of waste to landfill, i.e. the baseline scenario in the absence of K3 as a whole (including the proposed increase in treatment capacity).

The results presented in this addendum are derived from an expansion of the WRATE models developed for the November 2018 report. Apart from the inclusion of a new scenario (assessing all waste to landfill) no other modifications to the WRATE projects, scenarios or background data assumptions have been made; the results and conclusions within the November 2018 report therefore remain valid.

Carbon Impact of Facility Construction

The carbon impact of constructing the Facility is included within the results of the November 2018 report, albeit not explicitly extracted from the amalgamated carbon impacts of the scenario and documented.

The construction of the Facility results in a carbon burden of circa 2,109 tCO₂e (2.1 ktCO₂e) for the assessment year 2020. The presentation of the construction carbon impact on an annualised basis for the assumed lifespan of a facility is standard LCA practice. The modelled lifespan of the Facility in WRATE is 30 years, and therefore the total carbon impact of construction is a carbon burden of circa 63,274 tCO₂e (63.3 ktCO₂e).

Alternative Baseline of Landfill Disposal

A new scenario has been included within the WRATE model to assess the carbon impact of 657 kt of waste disposed to landfill. This alternative baseline scenario effectively assumes that K3 (as currently consented) had not been constructed.

The carbon impact of the landfill scenario, and its comparison against the Proposal scenario (657 kt to the Facility) are presented in Figure A-1 below.

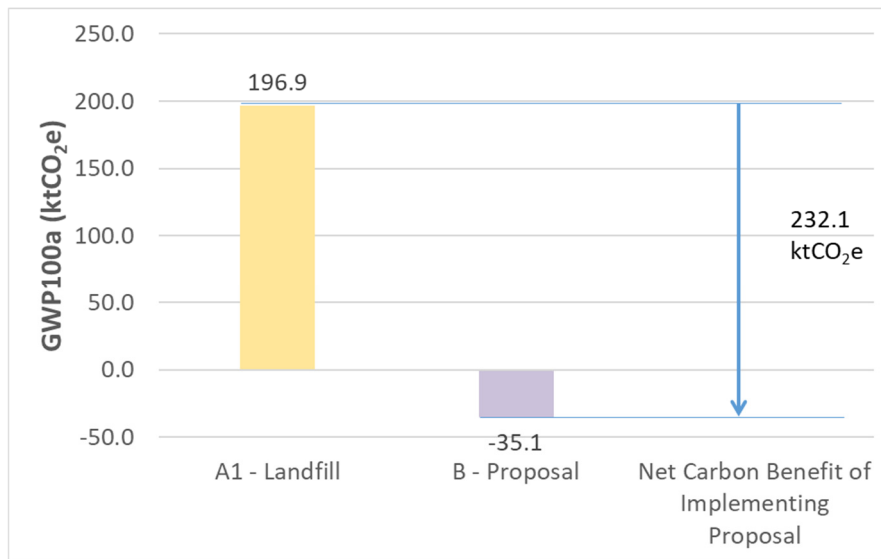


Figure A-1: Comparison of Proposal to Alternative Baseline (Landfill)

The results of the WRATE analysis indicate a carbon burden of circa 196.9 ktCO₂e from landfill disposal of 657 kt of waste. The direct emissions from landfill dominate the scenario results; with the avoided carbon burdens of electricity generated from captured landfill gas partially offsetting the direct emissions to derive the scenario total presented in the graph).

The Proposal results in an avoided carbon burden of circa 35.1 ktCO₂e (as documented in the November 2018 report). Comparison of the carbon impact of the Proposal to the alternative baseline of landfill disposal results in a net avoided carbon burden of circa 232.1 ktCO₂e.

Sensitivity Analysis

In order to maintain consistency with the November 2018 report, the addition of an alternative baseline scenario (landfill of 657 kt) has also been included within the sensitivity WRATE project, the results of which are reported below.

As detailed in the November 2018 report, the sensitivity WRATE project modelled a higher calorific value feedstock (the biogenic content by CV of the sensitivity feedstock remained unchanged) to demonstrate how indicative feedstock variability can influence carbon impact results. Apart from the waste feedstock composition, all other modelling assumptions remain unchanged from the base case WRATE model.

The carbon impacts of the landfill scenario, and its comparison against the Proposal scenario (657 kt to the Facility) for the sensitivity analysis are presented in Figure A-2 below.

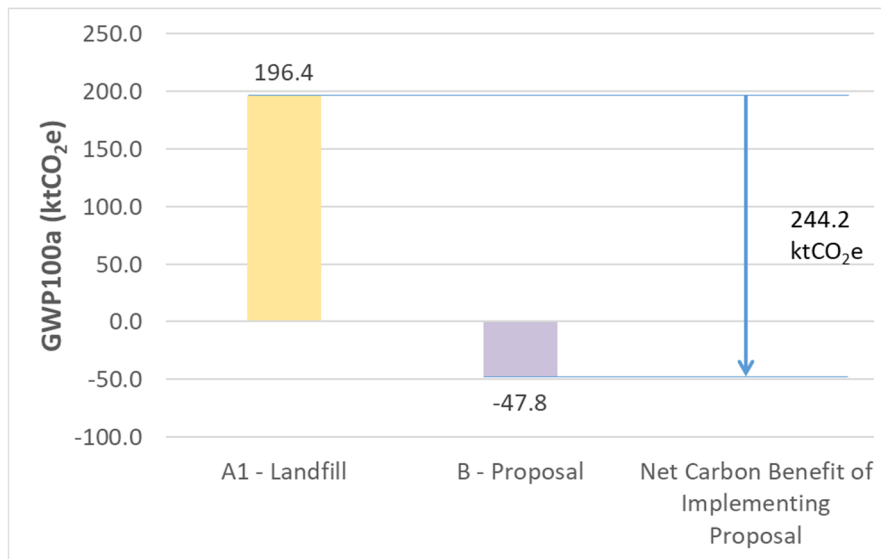


Figure A-2: Comparison of Proposal to Alternative Baseline (Landfill) for Sensitivity Analysis

The results of the WRATE analysis shows a carbon burden of circa 196.4 ktCO₂e from the landfill of 657 kt of waste (the sensitivity results show a minor variation from the principal model landfill scenario results due to rounding in waste composition assumptions).

The Proposal results in an avoided carbon burden of circa 47.8 ktCO₂e (as documented in the November 2018 report). Comparison of the carbon impact of the Proposal to the alternative baseline for the sensitivity analysis results in a net avoided carbon burden of circa 244.2 ktCO₂e.

The analysis presented above demonstrates that comparison of the Proposal to an alternative baseline (of all waste disposed to landfill) results in a net avoided carbon burden which is circa 3.9 times greater than that reported in the November 2018 report (where the baseline scenario was 130 kt to landfill and 527 kt to K3 existing planning consent and facility performance).