Summary of Comparison of the Carbon Intensity of Residual Waste Solutions

- Tolvik Consulting were commissioned to provide an independent comparison of the carbon implications of various Residual Waste treatment solutions. A copy of the full report is available, on request, from the Waste Team or Director of EPP.

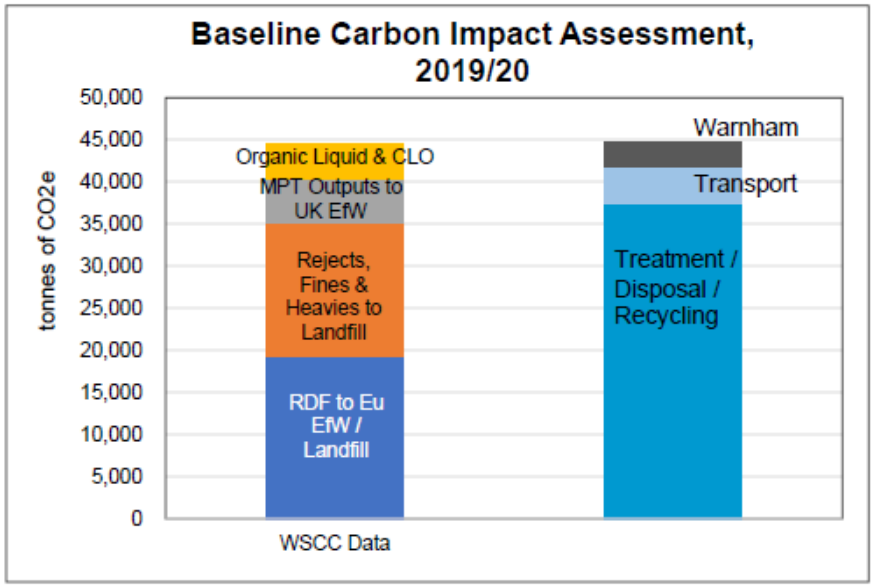
- The key objective was to derive an indicative baseline carbon impact using 2019/20 tonnages/destinations, and then compare this baseline to potential future scenarios, termed "Option 2" and "Option 3" (as described in the main report above).

- The "Option 2" scenario assumes a reconfigured Warnham site that undertakes Residual Waste processing to provide an RDF output. The "Option 3" scenario for the purposes of this report assumes that the Warnham site would become a basic transfer station for residual waste sent to UK EfW sites.

- Carbon impact modelling is complex and the analysis was based on a limited range of variables to provide a considered and robust comparison of some of the outcomes. It is possible that a different selection of fixed and variable parameters could provide different outcomes and therefore the analysis should be considered high level and indicative.

- The waste composition data used in the analysis was based upon the most recent 2021 Residual Waste composition analysis undertaken by WSCC. It is noted that includes significant higher food waste content, at 40%, compared to UK averages from other Waste Disposal Authorities (30%).

- The Baseline carbon impact assessment is estimated as 45kt of CO_2 eq using 2019/20 actual data from WSCC.

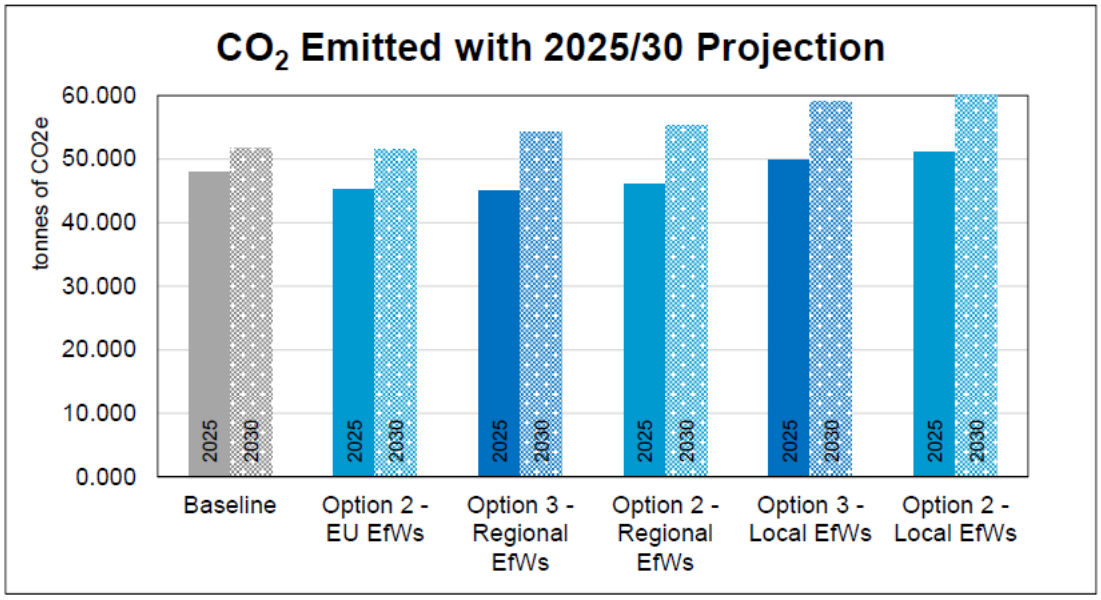


- The treatment / disposal of waste sent to EfW and landfill account for the largest fractions of the total carbon impact.

- Processing the material at Warnham (shown in dark grey, second column) accounts for a relatively small fraction of overall emissions. Transport of RDF into Europe (pale blue section above) has an impact although this also relatively small.

- The largest influences on the carbon intensity of the various Residual Waste solutions are:
  - the composition of residual waste (the biogenic content such as food waste in particular)
  - the size scale and efficiency of the EfW facility assessed (in particular whether heat is generated from the plant)
  - the future decarbonisation of the national electricity grid.

- At a high level, Tolvik conclude that the carbon impacts of the various Residual Waste solutions are broadly comparable, especially when considering actual tonnages are likely to be spread across various facilities.



- The analysis compares a scenario involving "Local EfWs" which are either existing facilities in neighbouring counties or sites in West Sussex / neighbouring counties which are planned or permitted but not yet under construction. Crucially, these sites have no (current or planned) heat offtake which means they operate (or, if built, would operate initially at least) at lower overall thermal and carbon efficiency than those with heat offtake. "Regional facilities" are those in the Southeast of England that either exist with, or are planned to have, heat offtake. These are generally larger plants.

- In 2025 the estimated emissions from Residual Waste sent to larger EfWs in the EU and UK Regional solutions are projected to be lower than the Baseline, i.e. <48ktpa. This is due to the scale, efficiency and heat offtake arrangements at these sites.

- The model predicts increased emissions towards 2030 resulting from an assumption that the benefit accrued from the power generation (as a substitute for fossil fuel sources of power, principally coal and gas in the national network)

declines as the national electric grid is decarbonised. It is not however a variable within the control of WSCC. The increase in impact for EU sites in 2030 appears relatively lower as they are not projected to decarbonise power generation to the same extent as the UK in the period.

- The removal of the food waste from the Residual Waste stream is clearly beneficial in many respects, including waste hierarchy, economic cost and carbon terms.

- Any material impacts on carbon reduction can only really be achieved through increased waste prevention and/or increased tonnages of waste being sent for reuse/recycling, thus removing it from the Residual Waste stream.

- In procuring a residual waste treatment solution, Tolvik suggest the council may wish to consider the weighting applied to evaluation criteria for solutions that propose larger, more efficient EfWs, ideally with heat offtake arrangements, to derive a further carbon benefit.