

**18 June 2019**

PINS ref: EN010093

GLA ref: 4509

**Greater London Authority and Transport for London  
Post Hearing Written Submission of Oral Case and  
Responses to Further Information Requested by the  
Examining Authority**

1. This note summarises the case made by the Greater London Authority and Transport for London at the Issue Specific Hearing for Environmental Matters on 6 June 2019 and the Issue Specific Hearing for the draft Development Consent Order on 7 June 2019 with regard to the Riverside Energy Park project, submitted by Cory Riverside Holdings Ltd ('the Applicant').
2. The note follows the agenda of both Hearing dates, as set by the Examining Authority (ExA), and sets out the case made orally by the GLA/TfL as well as further written points, where it is considered that these would aid the ExA, where time precluded full answers or where it is considered further clarification was necessary.
3. At both Hearing sessions, the GLA/TfL's submissions were made by Andrew Tait QC and Michael Fry of Counsel, with Douglas Simpson from the GLA, Stephen Inch from the GLA, Peter North from Calorem, Steven Moorcroft from Air Quality Consultant's and Tim De Laat of Transport for London (TfL). Short CVs, setting out each speaker's experience and professional qualifications, are provided at Appendix 1.
4. The GLA have also submitted the following documents at Deadline 3:
  - Sheet 1 – Applicant's Response to GLA Relevant Representations;
  - Sheet 2 – GLA Commentary on Applicant's response to ExA's first Written Questions;
  - Sheet 3 – GLA Commentary on other parties' Local Impact Reports / Written Representations; and
  - Sheet 4 - GLA commentary on other documents prepared by the Applicant for Deadline 2.

## Wednesday 6 June, Issue Specific Hearing – Environmental Matters

5. The GLA substantive participation began at agenda item 3 'Issues relating to waste management' and as such this note does not cover agenda items 1 (welcome, introductions and arrangement for the Hearing) and 2 (update from the Applicant on changes to the application and statements of common ground).
6. The GLA/TfL also did not provide oral submissions in relation to agenda item 5 (issues relating to biodiversity), item 7 (issues relating to flood risk), item 8 (next steps) or item 9 (closure of hearing).

### **Agenda item 3.1 - projections of volume of waste available for incineration**

7. The discussion began with the ExA asking the Applicant and the GLA to clarify the data presented in Table 2 from the GLA's Written Representation (WR). This was discussed at length by Kirsten Berry on behalf of the Applicant and Doug Simpson on behalf of the GLA. GLA WR Table 2 compares projections made by GLA and the Applicant for the amount London waste expected to be produced and the amount of energy from waste (EFW) capacity needed to manage London's non-recycled waste by 2031 and 2036. Paras 3.75 to 3.82 and Table 3 in the GLA's WR explains the data in Table 2 and explains the divergence between the GLA's and the Applicant's projections. The Applicant's projections are taken from Scenario 1, which is the draft London Plan case, as defined in 'The Project and its Benefits Report' (Document Ref. 7.2, Table 6.1, page 68). The GLA's projections are taken from modelling used to develop the London Environment Strategy (LES) and draft London Plan, both of which have been through a full public consultation.
8. At the Examining Authority's (ExA) request, the GLA has prepared additional information at Appendix 2a setting out further information and analysis to further explain the divergence between the GLA's and the Applicant's projections. The main reason for the divergence is the differing assumptions as to the amount of waste deemed suitable for management in a conventional waste ERF, which the GLA understands the proposed ERF will be. Appendix 2a contains a detailed analysis of the composition of the proposed waste feedstock and its potential for combustion to support the GLA's view. As a result, the GLA's estimates of London household, commercial and industrial waste available and suitable for treatment using EFW are 2.3 million tonnes in 2036, compared with the Applicant's projections of 2.9 million tonnes in 2036 – a difference of around 600,000 tonnes.
9. Appendix 2a provides the GLA's commentary on the other waste tonnage and EFW capacity scenarios presented in Table 6.1 of The Project and its Benefits Report.
10. At Deadline 2, the Applicant submitted the 'Supplementary Report to the Project and its Benefits Report' (Document Ref 7.2.1). Appendix A of the Supplementary Report is an assessment of the DEFRA Waste Strategy (Resources and Waste Strategy or RWS), prepared by Tolvik Consulting. It sets out national waste tonnage and energy from waste capacity need projections. The GLA has provided comments on these projections in Sheet 4 submitted at Deadline 3. In summary, the GLA challenges Tolvik's projections showing that the UK needs 5m to 8m tonnes per annum of additional new energy from waste infrastructure (para 3.16) supporting the REP case. In addition, the GLA is not convinced that UK capacity as a whole is relevant to a consideration of new capacity in London. Ultimately, whatever numbers are put forward will depend on the assumptions, targets applied, and the agenda sought. The case that a need for ERF exists for the REP to manage residual waste appears to be predicated on the assumed failure of government to meet its recycling and landfill targets (paras 3.9 and 3.10) to which Ministers have committed. The GLA considers this to be a speculative position which conflicts with national and European policy, as well as the position of the Mayor of London. Tolvik's assessment for national

additional EFW need is limited to those EFW facilities deemed in operation, or in construction. Tolvik has not identified which EFW facilities it considers will come forward from the full list of national EFW planning applications consented or seeking planning approval. The UK EFW capacity gap projection put forward by Tolvik is contingent on its assumptions, and conflicts with forecasts put forward by other commentators, including Defra and Chartered Institute of Waste Management (CIWM) (see Chart 3 in GLA WR).

11. The GLA's view is that the best recourse to determine EFW need is to take the publicly stated positions and forecasts of the UK Government, of local authorities and the EU, which support their objective to achieve circular economy targets. The Government's RWS clearly states the ambition and policy framework to achieve 65% recycling for municipal waste recycling and to significantly reduce the amount of waste generated (by around 10 million tonnes per annum) by 2035<sup>1</sup>. The RWS sets a significant policy shift to more effectively move waste up the hierarchy led through three consultations: 1. Strengthening Extended Producer Responsibility Requirements to make producers pay the full cost of dealing with their waste; 2. Introducing a standard recycling collection service; and 3. Introducing a material deposit scheme. The Government are also consulting on a tax on non-recyclable plastic and has signalled it may introduce a tax on incineration if its policies do not deliver the Government's ambitions in the long-term. Effective implementation of the RWS will result in considerably less waste available for incineration.
12. The GLA maintains that there is no need for the proposed ERF. The implications of excess EFW capacity would undermine achievement of strategic objectives set out in local and national plans, and the adverse effects would outweigh the benefits. Section 4 of the GLA's WR (at section WR4) sets out the implications of excess EFW capacity both in London and regionally in the context of not effectively implementing the waste hierarchy to comply with NPS EN-1 and EN-3 and would be detrimental to achieving the Mayor's and the Government's reduction and recycling targets set out in the LES and the RWS. Tables 2 and 3 of WR4 show that no additional EFW capacity is needed in London based on waste tonnage projections used in developing the London Environment Strategy published in May 2019. Charts 2 and 3 in WR4 show that no additional EFW capacity would necessarily be needed if the Government's reduction and recycling targets are met as set out in its Resources and Waste Strategy published in December 2019. In particular, Table 2 in the WR shows that London is expecting a significant surplus of around 300,000 tonnes per annum incineration capacity by 2036 if the Mayor's reduction and recycling targets are achieved. The GLA is concerned that approving the proposed ERF would also leave the local community with a stranded and undesirable asset.
13. Table 4 of WR4 summarises the need for EFW capacity in waste local plans in the South East of England and concludes that the Applicant's suggestion that there is a need for an additional 2Mt of capacity on the South East is not borne out. The GLA would further note that a recent planning decision by Essex County Council (Rivenhall Airfield, April 2019) considered the issue of need for EFW capacity. In reaching its conclusion on the excess capacity proposed (595,000tpa compared with an assessed need of 200,000tpa), the County Council considered that *"the excess capacity of the proposal is such that it would be likely to give rise to the management of waste not in accordance with the principle of net-self-sufficiency, proximity principle and management of waste not in accordance with the waste hierarchy"*. The GLA would concur with the conclusion reached by Essex County Council with regard to the effects of excess EFW capacity on the effective management of waste in accordance with the waste hierarchy.

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<sup>1</sup> Taken from Figure 8 RWS Evidence Annex at [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/765915/rws-evidence-annex.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765915/rws-evidence-annex.pdf)

### **Agenda item 3.2 – waste hierarchy**

#### **Effective implementation of the waste hierarchy**

14. Discussion began with the ExA seeking clarification on how anaerobic digestion is considered alongside EFW. Doug Simpson explained that although the two waste management techniques rest at the same level of the EU waste hierarchy, Defra guidance is that anaerobic digestion of food waste is the best environmental option and should be given priority. The ExA asked how the Applicant is ensuring effective implementation of the waste hierarchy in developing its REP application. The GLA considers that there is a significant risk that the proposed EFW facility would incinerate recyclable waste. This would conflict with NPS EN-1 Part 3.4 which states that “only waste that cannot be re-used or recycled with less environmental impact and would otherwise go to landfill should be used for energy recovery”.
15. The GLA’s concern stems from the failure of the Applicant to identify where the waste will come from or provide any evidence or real assurances that all reasonable efforts will have been made for the ERF to treat waste that cannot be reused or recycled. The Applicant places an over-reliance on the Environment Agency (EA) permit process to ensure that only non-recyclable waste will go to the proposed ERF. It is not the role of the EA’s permit process to interrogate or control the composition of the waste going to an ERF to ensure that it does not contain material that could be reused or recycled. Nor would the EA revoke a permit if an ERF was treating recyclable waste. The EA’s regulation of incoming waste is primarily aimed at environmental controls of the waste stream and to avoid waste movements being ‘lost’ in transit, for example to avoid illegal tipping.
16. Following the Hearing the GLA clarified the role of the permit with the EA by email on the 12<sup>th</sup> of June 2019 regarding this matter, and this confirmed the GLA’s assertion. The email conversation is set out in Appendix 2b attached.
17. The Applicant stated that it is the responsibility of the waste producer to ensure that recyclable waste has been separated from the residual waste stream prior to treatment via EFW. However, there is no requirement on businesses to separate their waste for recycling, source separation is not standard practice for the majority of waste collected from residential properties and existing businesses, and there is currently no mechanism in place to enforce consideration of options. The Applicant is a waste collector. In not identifying the source or nature of waste to be managed at the ERF, the Applicant has not presented the ExA with any evidence or assurances to assess effective implementation of the waste hierarchy, or to determine that the proposed ERF will not treat waste that could be reused or recycled. The GLA considers that evidence is needed, demonstrating that separate collection of recyclable waste, from both the Applicant and other waste collectors intending to supply the proposed ERF, has been undertaken complying with Regulation 13 of the Waste Regulations, which requires separate collection of recyclable waste. Regulation 13 states “Every collector (Waste Collection Authority or establishment or undertaking collecting waste) must, when making arrangements for the collection of waste paper, metal, plastic or glass, ensure that those arrangements are by way of separate collection”
18. The Applicant claims that it checks the nature of the waste twice a year to ensure it is suitable for treatment at the current RRRF facility in Bexley; however, this is mostly concerned with identifying hazardous waste or waste types falling out of the EWC waste code identified in the permit, rather than to identify and separate out recyclable waste.
19. In conclusion, the GLA considers that more evidence and assurances are needed from the Applicant to demonstrate effective implementation of the waste hierarchy, namely that the ERF will not treat waste that could be reused or recycled. The Environment Agency permit system and

the UK Waste Regulations<sup>2</sup> cannot be relied on for the REP to demonstrate effective implementation of the waste hierarchy and compliance with the NPS. The GLA has set out in its LIR, at paragraph 10.19, that the use of off-site pre-treatment should be required to recover recyclables. Pre-treatment would also ensure a better performance of the ERF against the Mayor's carbon intensity floor performance level to generate clean energy efficiently complying with the NPS, particularly if fossil plastic is recovered from waste prior to going to the ERF. The Applicant's claimed performance against the CIF is discussed in Agenda item 3.4.

20. The Applicant has not provided evidence that the four existing waste transfer sites (WTSs), which lie along the River Thames and are leased from Western Riverside Waste Authority (WRWA), can manage additional waste for onward management at the proposed ERF. The specific WTSs are known as Northumberland Wharf, Cringle Dock, Smugglers Way and Walbrook Wharf. The GLA considers that the ExA needs further information on the additional waste capacity available at the WTS sites because the deliverability of the Applicant's river-based transport system is dependent on the availability of the WTSs in London. No other WTSs have been identified by the Applicant for transferring waste onto the River Thames.
21. Furthermore, none of the documents which the Applicant has submitted to the Examination appears to consider the local impacts of additional waste managed at the WTS. The GLA understands that the four WTSs are already at, or near, full operational capacity, and is concerned that they are not equipped to manage large additional volumes of waste. For example, information taken from the London Waste Map<sup>3</sup>, a publicly available online map, shows the following tonnages of waste received at Cringle Dock Waste Transfer Station and reported to the Environment Agency 2014-2017. This shows that Cringle Dock WTS is already operating at full capacity.

*Site Name: Cringle Dock Ts*

*Borough: Wandsworth*

*License Number:83275*

*Operator: The Applicant Environmental Ltd*

*Site Broad Group: Waste transfer (household and commercial)*

*Tonnage Licensed:300,000*

*Year 2014 total tonnage received:263675.03*

*Year 2015 total tonnage received:288554.53*

*Year 2016 total tonnage received:307049.24*

*Year 2017 total tonnage received:308077.16*

22. WRWA, in its WR Annex 6, sets out a letter from the Applicant's former CEO Nicholas Pollard to WRWA Director Mark Broxup stating that, "...existing licensed capacity at LBTH (Northumberland) and Tilbury (WTSs) currently enjoy significant surplus capacity...whilst City of London (Walbrook Wharf), Cringle Dock and Smugglers Way WTS are considered as having 'more limited incremental capacity...".
23. The GLA considers that the Applicant should be asked to provide the ExA with an analysis of the capacity to manage additional waste at all four WTSs, including the extent to which these are

<sup>2</sup> (England & Wales) Regulations 2011, as amended in 2012.

<sup>3</sup> See <https://maps.london.gov.uk/waste/>

authorised by planning permissions and EA permits. The GLA considers that without this information the EA is not able to assess the full environmental effects of the proposed ERF, which is dependent on a large proportion of river-based transport. The worst-case assessments presented by the Applicant in its ES do not provide any assessment of the effects on air quality and noise arising from delivery of waste to the WTSs. Furthermore, in the absence of sufficient capacity at one or more of the WTSs proposed to service the ERF, alternative transfer facilities would have to be identified which may result in waste travelling by road for greater distances than assumed in the application. The Applicant has also not provided any information on vehicle movement caps at these WTSs and whether the daily additional vehicle movements generated to the WTSs by the REP would theoretically push the facilities past these caps.

### **Agenda item 3.4 – Combined Heat and Power**

24. The GLA disagrees that the 20,000 Peabody homes identified by the Applicant has the potential to be supplied by the REP. The London Borough of Bexley's RRRF District Heating Work Package 2 Report published in May 2019 (Ramboll Report WP2) has accounted for the revised number of Peabody homes. The Applicant's assertion that these homes would be supplied by the REP is therefore incorrect.
25. The London Borough of Bexley's RRRF District Heating Work Package 2 Report published in May 2019 (Ramboll Report WP2) concluded that all identified demand in the area could be met by 70% of the existing RRRF. The same report determined a project internal rate of return the district heating project would be between 7.3% to 11.1%, based on commercial discount rates. This suggests that homes considered for connection to the district heating network would fall short of commercial expectations (12%) making project viability a challenge. Considering the REP heat network would be, by necessity, far longer than that of the RRRF network (in order to reach the more distant heat customers), it would logically have a higher cost than RRRF for the similar level of customers. The business case would be beyond that of the private sector and would require public sector involvement. The role and likelihood of public sector involvement has not been investigated and therefore it remains unclear whether a REP heat network project could be implemented.
26. The Applicant's Combined Heat and Power Report identified the same heat load to be supplied by the REP as the London Borough of Bexley's RRRF District Heating Work Package 1 Report published in December 2018 did. The Applicant's Combined Heat and Power Supplementary Report 5.4.1, May 2019, identified additional heat demand that the REP could supply. The Applicant's method of heat mapping and screening used in this report to establish the heat demand is not as rigorous as either of the two earlier reports or that carried out for a similar DCO (the North London Waste Authority). The GLA believes the Applicant is over estimating the heat demand that the REP could supply.
27. The Applicant has suggested the social housing provider Peabody is supportive of the REP and that this is set out in their letter contained within the Applicant's Combined Heat and Power Supplementary Report 5.4.1 Appendix 1. The Peabody letter supports the Applicant's commitments to district heating, recognises their participation regarding the RRRF study work and acknowledges the REP DCO application. It does not single out REP in any other respect and it cannot be concluded that Peabody is in support of the REP as the Applicant has implied.
28. The GLA noted the Applicant's statement that the proposed data centre is to be supplied with both electricity and heat from the REP. Data centre cooling demand can be in the tens of megawatts, compared with the REP heat supply capacity of 28.5 MW, and this demand was not identified in either of the Applicant's CHP submissions. Further, the Applicant's stated intention

is that the heat would be used to provide cooling for the data centre by means of absorption coolers. The GLA considers that this is a very carbon-inefficient use of energy compared with the alternative of using electrically powered mechanical compression chillers. This heat demand was not identified in either of the Applicant's CHP reports 5.4 and 5.4.1 and continues to raise doubts about the adequacy of their CHP assessments.

29. The GLA's concern is that the REP will operate in power-only mode. The Applicant's estimate of the heat demand to be supplied by the REP is overstated. The investment case for connecting the more distant customers will fall short of private sector investment return requirements. There is no clear business case to build a heat network from the REP. If that is so, the REP will operate as a power-only plant, be a carbon producer and only partially renewable. Given the REP will be required to continuously operate to process the waste stream, it will therefore also continuously produce electricity that will be exported to the electricity grid. It will be an inflexible electricity generating plant and would have the potential to displace flexible renewable electricity, such as wind generated electricity, when electricity supply exceeds demand. This means that the very energy the NPS is seeking encourage, i.e., renewable and low carbon, will be displaced by the partially renewable and higher carbon electricity from the REP.
30. The Eunomia Report (Appendix 3) has determined that the REP, when operating in power-only mode, would have a higher carbon intensity (0.4 kg CO<sub>2</sub>/kWh) than the marginal generation it would displace (gas CCGT at 0.34 kg CO<sub>2</sub>/kWh). Assuming the REP becomes operational in 2021, the overall grid carbon intensity is forecast to be 0.26 kg CO<sub>2</sub>/kWh, which would be 35 percent less than the REP. The heat offtake is a fundamental point in trying to reduce carbon emissions. The GLA is concerned that the Applicant has overstated the heat demand that would be available to be supplied from the REP and that this contributes to there being no commercial business case for the heat network to be constructed so that the REP would operate as a power-only plant.
31. The GLA disagrees with the Applicant's response that the London Borough of Bexley's RRRF study work did not consider Lendlease's (Peabody) Thamesmead Riverside development. The RRRF District Heating Work Package 2 Report published in May 2019 (Ramboll Report WP2) included the revised numbers provided by Peabody. The revised heat demand of 141 GWh per year remains within the RRRF's capability to supply 200 GWh of heat per year.
32. The Applicant also stated that they considered carbon analysis was provided and is better than counterfactual. The GLA has set out its rebuttal to this analysis above and in Sheet 4 Other Documents Submitted by Cory at Deadline 2, in which the GLA states that a comparison with landfill is spurious if the Mayor of London's and the Governments recycling targets are met, as zero landfill (of combustible materials) would have been achieved. The GLA view, as set out in its Written Representation, is that once 65% recycling is achieved the ERF would replace recycling rather than landfill, and that this would have a negative effect on carbon (since the carbon benefits of recycling are substantially greater than any benefit that can be attributed to EfW).
33. The Applicant stated that the REP would be over 50% renewable and that there is no need in the NPS for it to be fully-renewable. The Applicant also noted that the development is both low carbon and renewable and that the REP would provide 'carbon savings' over alternatives, such as gas-fired plants, and that it would aid the NPS objective to transition the UK to the low carbon economy. The GLA disagrees that the REP will be low carbon. The Eunomia Report, Performance of the REP in the context of NPS Requirements, clearly illustrates that in power-only mode, the REP produces higher carbon emissions than the alternative of gas-fired plants referred to by the Applicant. Although the REP is not fully-renewable, there will be increasing circumstances where the REP will have the undesirable effect of displacing fully renewable electricity, such as wind, from the national electricity system. This is explained above.

### **Agenda item 3.4 - Carbon Intensity Floor**

34. The Eunomia Report, submitted by the GLA, concludes that it will be difficult for the REP to meet the CIF. It states that the REP has a high electrical efficiency (34%), whereas similar plants operate at 27%.
35. The Applicant stated that in the carbon assessment, it had compared the carbon efficiency levels of processing the waste in the REP with that of disposing of the waste to landfill. The GLA considers that carbon performance of the proposed ERF against landfill is not the proper comparator for compliance with the NPS. The Applicant should present performance against alternative energy generation options to fully understand the impacts both on energy generation output and carbon. Moreover, the Applicant claimed that it is not intended that REP will be a general plant, rather it should be one of most efficient in Europe. The Applicant claimed that through working with the construction industry and maximising efficiency through heat recovery REP can achieve 34.1% efficiency, as required to meet the CIF. It was not of much assistance to the ExA that the Applicant intends to achieve previously unseen efficiencies through “contractually confidential” technology.
36. The GLA considers that the ExA should be very wary of placing reliance on unproven and unexplained technology. The Applicant referenced the Ferrybridge MR2 as a soon to be operational plant that could demonstrate a best in class efficiency of 29%. However, that project is different to the REP in that it uses higher quality fuels (refuse- derived fuel (RDF) and waste wood). Higher quality fuel has different combustion chemistry and thermal conditions that could lend itself to higher efficiencies than a municipal solid waste fuelled plant such as the REP. The GLA’s position is that:
37. The claimed gross electrical efficiency of the REP of 34% is not validated by any comparable, operational EfW plant, which typically achieve efficiencies of around 25%.
38. Should the REP operate in power-only mode with no prospect of CHP operation, it would be a carbon producer and not a carbon reducer in comparison with the BEIS carbon intensity forecast of the UK electricity grid going into the future.
39. The uncertainty associated with the claimed energy efficiency rate has still not been clarified by the Applicant’s Supplementary CHP report. The GLA maintains the position that the applicant is overstating the efficiency of the plant and the Examination has been provided with no evidence that it could meet the CIF in power only mode.
40. The Applicant’s Supplementary Carbon Assessment also does not assist in understanding how the very high electricity generation performance of the REP might be justified, as the assumption here is merely restated from the earlier work without any additional justification. The Supplementary CHP assessment produced by the Applicant also does not provide any further insight in respect of this point. It remains unclear why the Applicant considers use of the net calorific value to measure the energy content of the waste is justified; this is justified in the Carbon Assessment by reference to the use of this value in the GLA’s Ready Reckoner tool, but without addressing the separate concerns as to the validity of this approach in the case where energy from water vapour is being recovered (as were raised in the analysis of the CIF performance). As such, these remain key concerns arising from the previous analysis.
41. Regarding demonstrable steps to meet the CIF, the Applicant, in its revised CHP Report, commits to making the ERF 'heat ready' and to its existing partnership to the Bexley District Hearing Partnership Board linked to the RRRF plant. This is considered the bare minimum. The GLA

would expect the Applicant to take all demonstrable steps as set out in paragraph 9.8.13 of the draft LP as a minimum. Without such commitments it is highly unlikely that the ERF will ever operate in CHP mode meeting the CIF.

42. Setting the CIF is the Mayor's approach for effectively implementing the Energy NPS and National Planning Policy for Waste. Given that the existing RRRF facility could meet the foreseeable heat demand, the GLA considers that that the proposed ERF would operate in power only mode and, therefore, would fall well short of the CIF level, be a carbon producer, and not be in compliance with the NPS EN-1 or EN-3.
43. Without any clarity of the source of waste and its composition, and evidence of actions taken to ensure recyclables have been removed, the GLA considers that pre-treatment of waste is necessary to pull out fossil materials (plastics) for recycling to effectively implement the waste hierarchy and comply with NPS EN-1.
44. The Applicant in its revised Carbon Modelling Assessment appears to consider that electricity generated using CCGT should be determined as the marginal source of electricity, and not apply the Department of Business, Energy and Industrial Strategy's (BEIS) long term marginal source projections. The most recent data by BEIS indicates that the long-run marginal is expected to decline from 0.357 kg CO<sub>2</sub> per kWh in 2010 (at which point the figure is consistent with the assumption that the marginal is gas CCGT) to 0.030kg CO<sub>2</sub> per kWh in 2046. Applying BEIS projections for marginal source electricity demonstrates that the proposed ERF would be a significant carbon producer, emitting between 0.3 and 0.4 kgs of CO<sub>2</sub> per Kwh electricity generated.
45. Emission savings in the Applicant's Carbon Modelling Assessment have only been compared with landfill and appear very high. The source of the Applicant's landfill emission factors cannot be verified by the GLA, and the ExA should require further detail to be provided. The emission factors used in developing the Mayor's EPS and CIF were taken from Government's MELMOD model.

#### **Agenda item 4 - Air quality**

##### **Selection and assessment of sensitive receptors**

46. Only a small number of receptors were explicitly modelled. The GLA does not consider this modelling to be sufficient to provide the ExA with a full analysis of the environmental effects of the REP, as larger numbers of residential and other sensitive receptors are captured within the plume. In line with best practice the Applicant should be required to provide some assessment of the extent and number of sensitive receptors exposed to non-negligible impacts in order to properly describe the impact of the development and provide sufficient information for the ExA to assess the significance of the impacts on air quality.

##### **Environmental Permit emissions limit**

47. The Applicant has submitted a different air quality assessment as part of its environmental permit application to the Environment Agency. The DCO Environmental Statement models NO<sub>x</sub> emissions from the plant at 120 mg/m<sup>3</sup>, the permit application models emissions at 75 mg/m<sup>3</sup>. The Applicant's permit application requests that the lower number be used as the emission limit for the plant. The Applicant explained that the permit application represents the best achievable emissions from the plant and their expectation that the Environment Agency would impose the requested emission limit. They provided no evidence to back up the latter point.
48. The emerging BREF note states that NO<sub>x</sub> emissions could be controlled to 50 – 120 mg/m<sup>3</sup> using selective catalytic reduction to abate emissions. Usual practice is for the permitting

authority to set the emissions limit at the upper bound of ranges set out in the BREF notes, or at the level set out in the Industrial Emissions Directive (IED) where the BREF note is not yet adopted. The IED limit for NO<sub>x</sub> emissions from energy from waste is currently 200 mg/m<sup>3</sup>.

49. A further complicating factor is that, although a permit can set emissions limits that are only achievable with a specific technology, they are legally precluded from requiring that a *specific* technology is installed.
50. Taking all these points together, including the likelihood that the emerging BREF note will be formally adopted before the end of the year, it is not clear what emission limit will be imposed by the permitting authority. There is no guarantee that the emission limit sought by the Applicant will be implemented through the permit.
51. The GLA believes it is reasonable therefore to take the figure used in the DCO application as a reasonable worst case. The points made by the Applicant were not sufficient to address concerns about the impact of NO<sub>x</sub> emissions from the proposed development.
52. The proposed use of selective catalytic reduction to abate NO<sub>x</sub> emissions would not provide further abatement of any of the other pollutants emitted from the plant.

#### **Environmental permit throughput or size limit**

53. Emissions limits set in environmental permits relate to the amount of emissions per volume of air expelled from the stack. Increases in the size or throughput of the plant after planning permission has been granted could therefore potentially lead to increases in the overall total amount of pollutants emitted, even where emissions limits are kept at the same value.
54. If the DCO is granted without some limitation on the size or throughput of the plant, it is possible that impacts on air quality could become larger than expected or accounted for in the Examination.

#### **Opportunity areas, residential development and air quality**

55. In the discussion regarding opportunity areas, it was noted that the Applicant's Air Quality advisor cited Beam Park, and the areas surrounding Beam Park, as areas of residential development affected by adverse air quality. This was indicated in the plumes shown in figures 7.5 (Nickel), 7.6 (arsenic) and 7.7 (NO<sub>2</sub>), within the Applicant's Environmental Statement figures.
56. Beam Park lies on the northern side of the Thames in LB Havering and is within the London Riverside Opportunity Area. It is useful to contextualise the importance of development in this area, as well as the other Opportunity Areas surrounding the site.
57. The Riverside Opportunity Area Planning Framework (OAPF) was adopted in 2015 and provides strategies for land uses to guide the regeneration of the area. The OAPF forms part of the Development Plan. It is anticipated that the London Riverside OA will accommodate approximately 44,000 homes and 29,000 jobs.
58. Figures 1 and 2 in Appendix 4 are extracted from the OAPF: Figure 1 indicates the land use strategy and Figure 2 shows the proposed built form. Residential development is primarily to be located to the south of the A13 in Havering and on Barking Riverside in Barking and Dagenham. When the plans for the Opportunity Area are compared with the expected air quality impact plumes, as provided in the Applicant's Environmental Statement, it is clear that a part of the OA is within the isopleths showing areas impacted by increased nickel, arsenic and NO<sub>2</sub> concentrations at ground level, as shown in figures 7.5 – 7.7 in the applicant's ES, and a

significant amount of the OA is within close proximity to the mapped impacts, and may therefore be subjected to increased pollutant concentrations both at ground level.

59. Furthermore, the Applicant's plume models are based on ground level concentrations. Given the height of the stack, there will be higher concentrations of these pollutants at greater heights. Opportunity areas, and areas around transport nodes, are expected to be subject to higher density development, where development is prioritised, as set out in the London Plan and draft London Plan.
60. Since the OAPF was published in 2015, several planning applications have been approved in this area, including the following strategic applications:
  - a. Dover's Corner, approved in 2017 for 394 residential units (LPA ref: P0922.15);
  - b. Beam Park, approved in 2019 for up to 3,000 residential units, 2 primary schools, a multi-faith worship centre and a new railway station (GLA ref: 2933a).
61. Beam Park will be 16 storeys at its tallest point, with a number of buildings above 6 stories. Dover's Corner will feature predominately 4 storey buildings, with a 5-storey block. It is anticipated that there would be a greater impact on the upper floors of these buildings as the pollutant concentrations will be higher close to the centre line of the plume than at ground level. As such, it is not considered that the isopleths in figures 7.5-7.7 illustrate the worst-case scenario.
62. In addition to these consented strategic developments, there are a number of residential-led developments in the Beam Park area (shown in figure 2) that are presently in their pre-planning application phase. Whilst the density of the remainder of the Beam Park / Rainham area is expected to be lower rise than the Beam Park site itself, the draft London Plan and London Plan seek that opportunity areas maximise development potential, particularly around transport nodes.
63. There is, therefore, significant new residential development both permitted and emerging within the areas that will suffer from identified levels of adverse air quality.
64. The impact of the proposed development may prejudice the delivery of the Opportunity Area, and particularly the higher density elements, either directly through the creation of areas where it would be unacceptable to introduce new receptors or through the elevation of existing pollutant concentrations to the point where new development could be at risk of creating new exceedances.
65. The delivery of the Opportunity Areas, at their anticipated density and height, is key for the achievement of the ambitious housing targets set out in the London Plan. Meeting these housing targets is vital to ensure that London's projected growth is sustainably accommodated within the capital.
66. The location and density of the Opportunity Areas was also an important factor in the development of other Mayoral strategies, such as the Mayor's Transport and Environment Strategies, which commit to the delivery of infrastructure and services ahead of need to enable the development of the Opportunity Areas; investment that will be wasted if delivery is constrained by poor air quality.

## **Agenda Item 6 – Transport**

### **Use of Road and River Transport for Delivery of Waste**

67. At the hearing TfL's view was expressed that as the Transport Assessment submitted by the applicant states that the current RRRF facility, adjacent to the proposed ERF site, operates with a minimum 75% of waste being delivered via river, the proposed development would be expected to do as well, if not better. The adopted London Plan as well as the draft London Plan clearly set out a policy base for increased use of the River Thames; specifically draft London Plan policy T2 'Healthy Streets' which aims to reduce dominance of motorised vehicles on London Streets, London Plan Policy 5.17 'Waste Capacity' which encourages further intensification of the use of the river for waste transfer purposes, London Plan policy 6.14 'Freight' which aims to promote movement of freight by rail and waterway, London Plan policy 7.24 'Blue Ribbon Network' which prioritise uses of the waterspace and land alongside it safely for water related purposes, in particular for passenger and freight transport, and London Plan Policy 6.26 'Increasing the use of the Blue Ribbon Network for freight' which aims to increase the use of the Blue Ribbon Network to transport freight.
68. Increasing use of the River Thames for freight will only be possible if facilities which are located along the river and already have access to infrastructure that enables use of the river are required to use it as much as is feasible and for these targets to be more ambitious for new developments than they were for older facilities.
69. Though it is accepted by the GLA/TfL that the relationship between number of vehicles and amount of waste moved is not completely linear, the applicant has provided an estimate of the number of daily vehicles required for the ERF in a 100% by road scenario: 321 per day, which includes waste deliveries, and movements associated with by products and consumables if the ERF operates at its maximum capacity, which the applicant has stated during the hearing is unlikely to occur and is well above the nominal throughput assessed in the nominal scenario for the ES. The GLA and TfL considers that a cap of 80 vehicles delivering waste, which would be approximately 25% of the ERF's maximum waste throughput is reasonable. This would therefore already have contingency built in for varying sizes of loads in the nominal scenario.
70. As presently drafted, the Applicant would be permitted to use larger size HGV vehicles to transport a higher proportion of the waste to the site, or it could use many small vehicles which would not be subject to the proposed cap. For that reason, TfL considers that it is important and reasonable to impose a Requirement to limit the volume of waste. TfL suggests that this volume limit should be 201,850 tonnes per annum (t/pa), which is 25% of the ERF's maximum waste throughput and 31% of the ERF's nominal scenario waste throughput of 655,000 t/pa. These figures allow for a reasonable contingency
71. If the Applicant considers that this cap cannot be achieved, then further assessment should be provided showing that all efforts have been made to use the river for transporting waste.
72. During the Hearing, the Applicant proposed sharing the vehicle-per-day cap of the RRRF, which is set at 90 as per a planning condition, with the 90 vehicle per day cap of the proposed ERF facility, essentially creating a shared 180 vehicle per day cap for the facilities as a whole. TfL expressed that it is considered likely that sharing the cap will result in more overall vehicle movements, especially as the RRRF is currently operating at or below its existing cap. Allowing the proposed development to use share capacity would not be in line with the draft London Plan and London Plan policies.
73. Furthermore, TfL objects to the Applicant's framing of the operation of the facilities below the 90 vehicle per day cap as "redundant" capacity: the caps are not a target and, therefore, any operation below the cap would simply be complying with the planning condition of the RRRF

and DCO Requirement of the REP. The lower the number of vehicle movements to the RRRF and REP, the better it would be in policy terms.

74. At the DCO Requirement hearing on the 6<sup>th</sup> of June, the Applicant announced that the cap would no longer be shared between the two facilities, which is welcomed by the GLA/TfL. However, a sound mechanism to monitor compliance of the REP with the cap will need to be in place in order for the Requirement to be acceptable to the GLA/TfL.

### **Car Parking**

75. The applicant has reduced the number of car parking spaces at construction phase from 550 to 275 spaces in paragraph 4.5 of the Construction Traffic Management Plan.
76. Now that car parking is halved, more workers will need to come to the construction site via sustainable transport modes. The CTMP considers several of these, however does not commit to specific measures to enable this mode shift. The Applicant stated that the final CTMP, which will be signed off by the LHA and TfL will commit to these measures. This is welcomed by TfL, though it should be noted that TfL has outstanding comments on Requirement 13 'Construction Traffic Management Plans' which are set out in this document.

### **Delays to road users during construction of the Electrical Connection**

77. The applicant has chosen an Electrical Connection route, which is to run along the A2016 and other strategic roads used by road users and buses. There are a few bus routes that run across or along the Electrical Connection Route, including the 99, 180, 229, 401, and 428 as well as two school bus services. These may be affected if the construction of the electrical connection causes disruption on the road network
78. Figure 3 in Appendix 4 sets out the location the Electrical Connection route and the bus routes run by Transport for London to show the areas where conflict between construction activity is most likely to occur.
79. At the Hearing and in its TN13, submitted at Deadline 2, the applicant stated during the hearing that the construction of the Electrical Connection would likely have an impact on the Erith Roundabout and James Watt Way junction. During the Hearing it was pointed out by several participants that the Electrical Connection construction would likely have an impact on several parts of the highway network, specifically the parts of the network which are not dual carriageway, two-lane roads and other junctions. In Figure 3, TfL have indicated what parts of the construction route would likely have the largest impact on buses.
80. TfL/GLA consider that the level of assessment on the impact of Electrical Connection construction on buses has not been sufficient at this stage. To plan bus frequency increases and potential diversions to mitigate delays caused by the Electrical Connection construction, TfL will need to know the level of delay caused by the Electrical Connection's construction. TfL set out an example where the Electrical Connection would run along a roundabout and construction would necessitate a lane or arm closure at this roundabout. An assessment would need to be done to show how this would affect buses running on these roundabout and what level of delay would be expected to occur so that appropriate mitigation through the Construction Traffic Management Plan can be determined.
81. Section 2 of Requirement 13, which covers Construction Traffic Management Plans states:
- "The construction traffic management plan(s) submitted pursuant to sub-paragraph (1) must be accompanied by a statement explaining how the likely construction traffic impacts identified in the environmental statement are addressed through the measures contained in the construction traffic management plan(s)."*

82. The above would not cover effects on buses, as the full bus impacts in terms of delays were not identified in the environmental statement. ES Transport Chapter paragraph 6.9.67 states:

*“The severance effect to these bus services would vary from Minor adverse, where short lane closures and alternate way traffic signals are used, to potentially Major adverse if temporary road closures are required where no suitable alternative routeing is available for the affected bus services. The details of these impacts are not known currently and would be detailed as part of the CTMP, secured through the DCO.”*

83. The GLA/TfL consider that the full construction impacts would not be detailed as part of the CTMP as currently submitted. Paragraph 2.4.11 of the Outline Construction Traffic Management Plan submitted at Deadline 2 by the applicant states that:

*“An appraisal would be included within each CTMP of the anticipated disruption to bus services during that stage of the works. This would be developed in consultation with the bus service operator and should include such matters as:*

- proposals for the method of traffic management;*
- a judgement of the disruption to those services;*
- details of any proposed diversions or suspensions to*
- bus stop suspensions or temporary relocations; and*
- the programme for those impacts; and*
- the monitoring and review processes to be used.”*

84. This does not go into detail about what this appraisal would be nor its level of detail. The paragraph refers to “a judgement of the disruption to those services” being included in the statement, but does not commit to an assessment which will show the likely delays to bus services.

85. The GLA/TfL considers that it would be reasonable for a statement to be included in the CTMP to state that the likely disruption to bus services would be assessed to show: the likely delays to bus routes; the level of mitigation required through bus frequency increases; and any diversions to minimise this impact.

86. Modelling of the junctions along the electrical connection route as highlighted in Figure 3 may be required if an alternative realistic method of assessing bus delays cannot be produced by the applicant. Modelling of construction impacts by applicants is standard practice for large development which would likely have an effect on the operation of bus services. This was done for several other developments including the Old Street roundabout development. Micro-simulation modelling of the whole network shall not be required, as TfL Network Performance have indicated that due to the rolling nature of the works along the network, this would not be suitable.

## Thursday 6 June, Issue Specific Hearing – Development Consent Order

87. The GLA substantive participation began at agenda item 5 ‘Schedule 2 Requirements – changes proposed by the Applicant and Interested Parties’ and as such this note does not cover the other agenda items.

### **Agenda item 5 - Schedule 2 Requirements - changes proposed by the Applicant and by Interested Parties**

88. The GLA noted at the Hearing that there is nothing within the DCO that requires the Applicant to provide the AD facility (Work 1B), battery storage (Work 1D) and solar panels (Work 1C). The GLA consider that there should be a Requirement to provide these facilities within a given timeframe. Further, with regard to Requirement 20, there is no commitment as presently worded to undertake the Work 3, which is the necessary enabling works to ensure that heat can be exported from the site. Appropriate Requirements are necessary to ensure that these works are carried out.

89. In addition, the GLA would expect to see additional Requirements on the following, as set out in Sheet 4:

- a. Commitments to connect the proposed AD facility to the gas grid (or use to power vehicles);
- b. Commitment to delivery of AD, battery storage and solar PV;
- c. Measures to ensure that waste that is used in the ERF is pre-treated to remove any recyclable waste;
- d. Commitments to meeting the draft BREF limits for emissions, including the installation and operation of SCR if required. Additionally, the DCO should prevent the plant growing beyond the assumed throughput and output.
- e. Delivery of waste and ash to be zero carbon; and
- f. Compensation for disruption to bus services.

#### Requirement 11

90. It is noted that the Applicant agreed to adopt the London Non-Road Mobile Machinery Low Emission Zone standards as a requirement of the DCO, should permission be granted, at the Hearing.

91. It is noted that the trigger for the submission of the Code of Construction Practice is commencement. The GLA have some concerns regarding the definition of commencement at present, noting that it excludes the removal of topsoil, which is likely to generate significant traffic movements. In this regard, the GLA consider that the Code of Construction Practice should be prior to commencement of the development (noting the below concern regarding the definition of commencement).

#### Requirement 13

92. As noted above, the GLA raised concern regarding the definition of commencement and the exclusion of pre-commencement works from the CTMP. The GLA do not consider that the wording of the Requirement is acceptable at present, as the traffic impact of the construction works should be considered in totality. There are, for example, expected to be significant transport movements involved in the topsoil removal.

#### Requirement 14

93. The Applicant is proposing a 90-vehicle cap which, according to the Transport Assessment submitted, is roughly 28% of the ERFs maximum waste demand. This means that on average days where the plant operates below capacity the percentage of waste coming in by road would be even higher. As discussed at the hearing, this is not acceptable to TfL or LBB. LBB stated at the hearing that, whilst the AD traffic will be local, non-Bexley traffic to this facility should also be required to come in by river. The GLA agree with this position.
94. TfL/GLA propose a maximum cap of 80 vehicles per day which would account for around 25% of the ERF's vehicle movement demand in a 100% by road scenario. This cap should not just apply to vehicles delivering waste to the ERF, but also to vehicles delivering and collecting by products and consumables (excluding those associated with the anaerobic facility originating from within Bexley). The Applicant stated that the 90-cap is slightly above 25% to provide some flexibility for the site. However, the Applicant also stated that the site is not expected to generally operate at maximum capacity. On that basis it is considered that a hard cap of 25% would already have some contingency built in and, therefore, additional flexibility would not be acceptable.
95. With regard to the above, NPS EN-1 (at paragraphs 5.13.9 - 5.13.10) states that the IPC should aim to secure more sustainable patterns of transport, and that waterborne transport is preferred over road at all stages of the project, where cost-effective. The TfL/GLA considers that the Applicant has not sufficiently addressed this policy requirement, noting the proximity of the river.
96. Both TfL/GLA and LBB objected to the Applicant's proposal that the ERF and RRRF share any redundant capacity between the two 90-vehicle caps on their developments, effectively providing a single 180 vehicle cap. The Applicant confirmed at the Hearing that this proposal was to be removed.
97. LBB also raised concern with the inclusion of additional movements allowed during 'jetty outages' as well as the definition of 'jetty outages', stating that a provision for an 'extraordinary jetty outage' should be included. In jetty outage situations, there could be up to 300 vehicles in / out, which is a doubling of the RRRF requirement. The ExA asked the applicant to clarify whether the '100% by road' assessment by road included the 300 vehicles associated with a RRRF in a jetty outage. It is noted that the Applicant stated that they would confirm this in a note at Deadline 3. The GLA/TfL will review this note upon its submission to ascertain whether it results in any additional impacts that have not been considered within the original ES.
98. The GLA would expect a Requirement specifying the following: an agreed level of maintenance for the jetty; a maintenance plan to minimise the likelihood of any jetty outages; an effective contingency plan to restore jetty operation to minimise build-up of waste; and a reliance on the road network for its transport.

#### Requirement 18

99. The GLA considers that the Applicant has not yet provided sufficient detail for it to assess whether the proposed Employment and Skills Plan would be acceptable. The GLA would expect that there is a commitment to paying the London Living Wage, if not through the community skills plan, then as an obligation within a s106 agreement. The GLA expect to be consulted on the Employment and Skills Plan when submitted and the Requirement should be amended as such.

## Requirement 20

100. The GLA do not consider that Requirement 20 is suitable at present, as set out in the Local Impact Report at paragraphs 10.14 to 10.18. The GLA maintains this position. Further, the GLA note that part 2b of the Requirement states that the CHP review document, which is presently required to be submitted to the LPA 12 months after the final commissioning, must “include a list of actions (if any) that the undertaker is reasonably required to take (without material additional cost to the undertaker) to increase the potential for the export of heat from Work No. 1”. This is not considered to be acceptable. If Work 3 is carried out, there is no requirement to carry out any further work relating to the CHP if it will cost the undertaker more. The GLA consider that this clause significantly limits the likelihood of heat offtake being developed on the site.
101. Further, the GLA consider that part 2a of the requirement should be amended to remove ‘reasonably’.
102. Part 4 of the Requirement sets out the need to submit revised CHP reviews. The GLA considers that this should be every 24 months, rather than every 5 years. At the hearing, the Applicant noted that the RRRF study took 24 months to carry out; this was a result of LLB suspending the study work until it had completed its housing strategy, a key issue in determining the most accurate forecast for heat demand. Study work of this nature takes around 6 months to complete and, therefore, it is not considered onerous or unreasonable for reviews to be submitted every 24 months.
103. It is not considered that the Applicant has adequately evidenced ‘demonstrable steps’, as set out in their Combined Heat and Power Assessment, document reference 5.4, for the following reasons:
- a. The area studied is covered by the Bexley RRRF report and made no reference to the fact that the existing RRRF would supply the demand.
  - b. Made reference to the Energy Efficiency Directive (EED), the results of which were quoted in the SoCG meetings with the GLA. The EED is not relevant to the DCO since it refers to a European Union initiative to reduce Europe’s dependency on imported energy. It determines efficiency targets based on European comparators not found in the UK (i.e., comparisons with heat-only boilers using waste). The EED does not explicitly consider CO<sub>2</sub> reductions.
  - c. Was supplemented by the Applicant’s Combined Heat and Power Supplementary Report, document reference 5.4.1, to address the above issues. The methodology of heat mapping and screening was less rigorous than the CHP report.
104. The GLA is, therefore, not confident that the Applicant was correctly addressing CHP and therefore doubts whether the right carbon outcomes would be achieved.

## Appendix 1 – CVs

### **Doug Simpson**

Current role: Principal Policy and Programme Officer, Waste and Green Economy Team, GLA Environment Team. Leads on Waste and Circular Economy Policy

Qualifications: Bachelor's Degree in Resource and Environmental Planning (NZ)

Experience: 18 years environmental policy experience, predominantly for the GLA (since 2006), leading development of the London's waste and circularly economy policy programme. Experience at the GLA also includes modelling waste projections, using independent consultants to inform London's waste infrastructure need and informing the evidence base supporting the development and delivery of the Mayor's strategic statutory plans; the London Plan, London Environment Strategy, and Responsible Procurement Policy.

### **Stephen Inch**

Current role: Senior Policy and Programme officer, Air Quality, GLA Environment Team

Qualifications: BSc (Joint Hons) Physics and Philosophy, MSc Environmental Diagnosis, Diploma of the Imperial College

Experience: 15 years' experience working in industrial air quality, environmental permitting and Local Authority Air Quality Management

### **Peter North**

Current role: Director and Principal of Calorem Ltd.

Qualifications: BSc in Engineering, MSc in Building Services Engineering, Fellow of the Institution of Mechanical Engineers and a Chartered Engineer.

Experience: Professional career spanning almost 40 years within the energy sector for both private and public applications. Experience covers a broad range of energy technologies including power generation, energy from waste, combined heat and power and district heating based a range of energy sources from nuclear and fossil fuels to renewables.

### **Steve Moorcroft**

Current role: Director at Air Quality Consultants Ltd

Qualifications: BSc Biology, MSc Environmental Technology

Experience: Director of Air Quality Consultants since 2004, with 35 years postgraduate experience in environmental sciences.

### **Tim DeLaat**

Current role: Consultant Senior Technical Planner, Spatial Planning, Transport for London

Qualifications: BSc in Traffic and Transport Management, MSc in Transport Planning and Management, Member of the Chartered Institute of Highways & Transportation (CIHT)

Experience: 6 years of professional work experience in transport and highways.

**Appendix 2 – Waste items**

- Appendix 2A – Waste note (refer to separate PDF document)
- Appendix 2B – Email correspondence with the Environment Agency (refer to separate PDF document)

**Appendix 3 – Eunomia report (refer to separate PDF document)**

**Appendix 4 - Figures**

**Figure 1** – Extract from London Riverside OAPF, showing existing and proposed land uses.

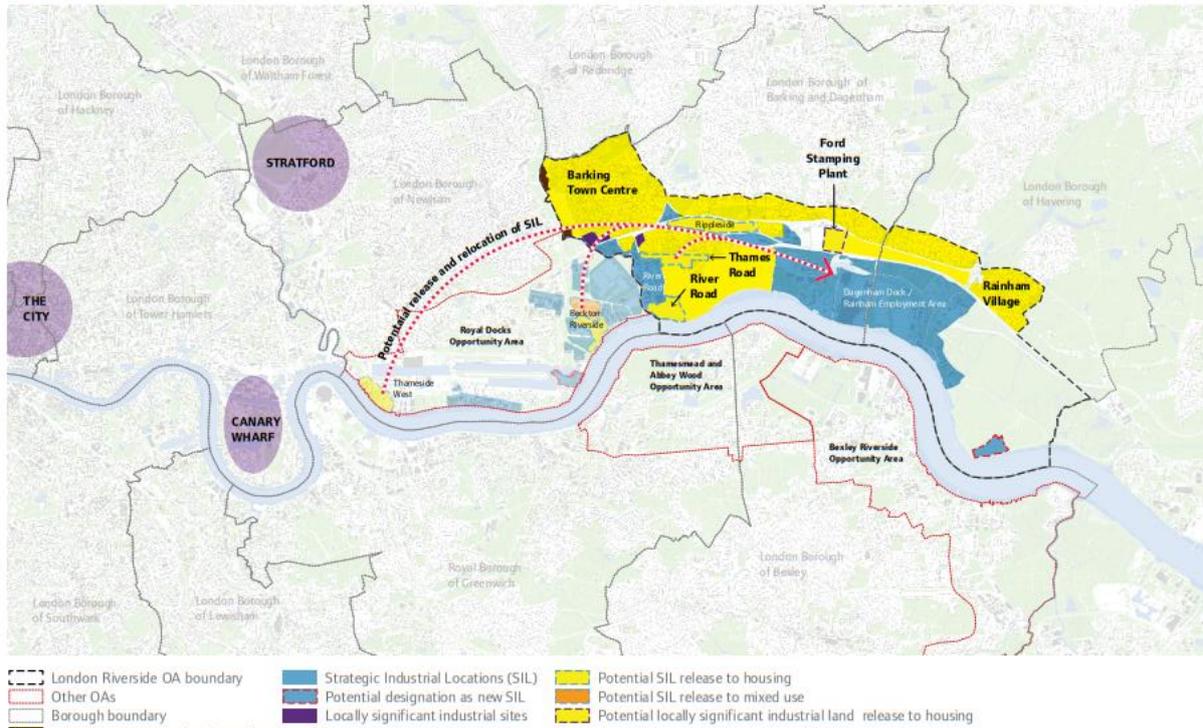


Figure 3.1 Existing and proposed land-use

**Figure 2** – Extract from London Riverside OAPF, showing London Riverside built form

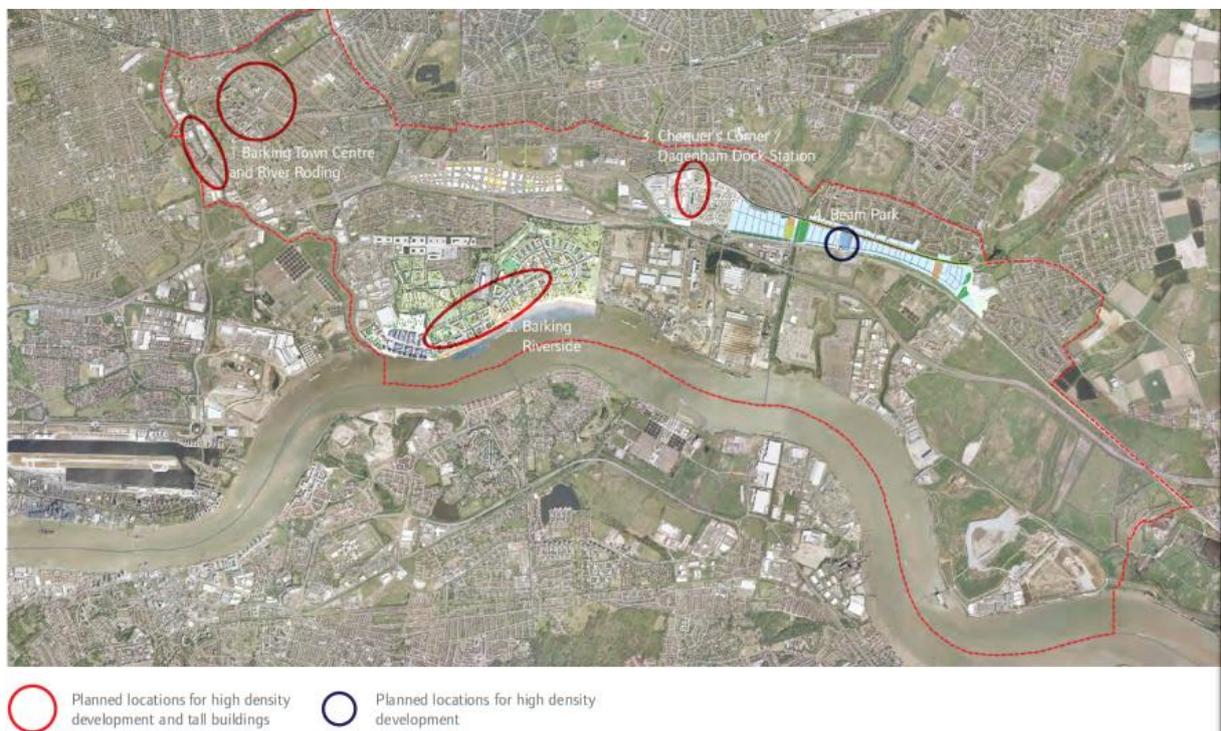


Figure 5.8 London Riverside built form

**Figure 3** Electrical Connection Route and Interaction with buses

