
Technical Briefing Note

To:	NLWA – [REDACTED]	Report	
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Optimism Bias Assumptions Query - Defra-

Introduction

NLWA have received the following question from Defra in relation to the Optimism Bias (OB) assessment contained within the NLWA OBC submission.

“In relation to the optimism bias paper prepared to support the optimism bias assumptions could you please provide us with a copy and would suggest this forms part of the supporting information for appendix N.”

Source and detail of the OB Assumptions

The assessment for optimism bias on the NLWA project was carried out using the base assumptions contained in the Mott MacDonald study “Review of Large Public Procurement in the UK, July 2002” This study reviewed the outcome of large public procurement projects in the UK over the last 20 years as part of an exercise to revise the Green Book. The objective of the study was to provide guidance, for the public sector, to evaluate and reduce excessive optimism in project estimates during appraisals.

AEA's calculation of optimism bias for the capital expenditure and works duration include the upper bound optimism bias levels taken from the Mott's study Appendix I Project Risk Areas Optimism Bias Tables for Current /Future Projects. This provided the distribution of the causes of cost overruns or delays to projects. It should be noted that this dataset was not waste-specific as the number of projects that could be assessed was too small and this in itself provides a high degree of potential variance due to the very different nature of waste projects compared to other public construction projects. However, this is the only dataset to provide any evidence base on the nature and degree of cost and time overruns to projects.

The effectiveness of the mitigation actions has been assessed for each of the risk areas separated in to Works Duration (WD) and Capital Extensions (CE), these assessments are based on professional judgment. We are not aware of any analytical data available on the effectiveness of applying mitigation actions. The risk categories were assessed as:

- unmitigatable and obtained zero, %
- poorly effective and scored 25%,
- medium effectiveness and score 50%
- reasonably effective to very effective and score between 75% to 90% or
- were considered to completely mitigate the risk and scored 100%

The mitigation percentages and the distribution of risks are then cross multiplied to provide an aggregate effectiveness of the combined package of mitigation actions.

The cost of the mitigation actions were based on the additional costs of applying the mitigation actions and primarily this relates to the costs of advisor support (£500k) that is applied to risk mitigation rather than direct resource supply to the project. Where the specific actions are mentioned that would be provided by the advisor support then no additional costs has been incorporated. The only area where further costs have been identified is the development of a waste strategy where the costs of consultant

support (£60k) is estimated as this task is carried out separately from the procurement support roles identified by the other costs.

AEA allocated the capital costs into classes in accordance with the Mott McDonald report as follows:

- standard buildings,
- standard civil engineering,
- Non-standard civil engineering and
- equipment

AEA then applied the assessments to the mitigation and risk at this level of cost breakdown for both the residual waste treatment contract and the solid recovered fuel contract.

Mitigation Assumptions

Where it was agreed that mitigation measures would be able to significantly reduce risk occurrence, a value was assigned that reflected the costs associated with the mitigation measures relating to the differing project type allocations (e.g. In the Motts study¹, 1% of the increases in the work duration occurred as a result of the complexity of the contract structure (In the standard buildings contract component which represents 10% of the contract) and it was considered that approximately 75% of this risk could be mitigated against through the use of technical experts and the development/ review of risk matrices (this would result in an overall reduction of risk occurrence from 1 % to 0.25%. It was assumed that the cost associated with mitigating this risk was £500k).

The table below provides details of the mitigation measures that would be required for each Work Duration/Cost Extension risk; their associated cost impacts are shown in the attached excel spreadsheets.

To work out the total optimism bias, the mitigated proportions of the upper bound levels for the relevant project type allocations (the upper bound levels are contained in the Treasury Green Book and also the Motts study – Table 2².) were calculated to give an OB percentage. This percentage makes up the proportion of total costs associated with optimism bias, which can then be summed from all the relevant project type allocations (Standard buildings, Standard Civil engineering etc.) for both the capital expenditure and works duration elements to provide the total optimism bias.

¹ Mott Macdonald, Review of Large Public Procurement in the UK, July 2002

² ² Mott Macdonald, Review of Large Public Procurement in the UK, July 2002

Risk category		Mitigation action	Degree of mitigation	
			Duration	cost
Procurement	Complexity of Contract Structure	Use of technical experts and detailed risk matrix.	50%	50%
	Late Contractor Involvement in Design	Output specification therefore detail will be specified by experienced waste companies. No planning permission obtained yet so aspect not mitigated.	25%	25%
	Poor Contractor Capabilities	Well mitigated by robust tendering process. Separation in to fuel use and service increases level of expertise Equipment less mitigated due to recent technology	85%	90%
	Government Guidelines			
	Dispute and Claims Occurred	Waste strategy will provide security.	85%	7%
	Information Management	There is a consultation process yet there will always be some opposition, separation of fuel use will limit impacts on waste services contract		90%
	Other			
Project Specific	Design Complexity	Hendon already identified and well supported in the planning documents, other sites still being identified.	100%	100%
	Degree of Innovation	Robust evaluation and advisors on board will provide good mitigation.	70%	70%
	Environmental Impact	EIA will be conducted	0% ³	0%
Client Specific	Inadequacy of the Business Case	Clear output specification also clear waste strategy in place.	85%	85%
	Large number of Stakeholders	Strong relationships through NLWA officer and member groups already established and working Strong consultation in place	100%	
	Funding Availability	Availability of project finance increasing as is bank's appetite for waste market however with unproven technology this can never be fully mitigated. Separation of services and fuel use reduces risk to private sectors	50%	
	Project management Team	Team has already delivered a waste PFI.	85%	85%
	Poor Project Intelligence	Some sites already identified however no ground investigations conducted	20%	20%
Environment	Public Relations	Protest action is already active related to Edmonton and move to MBT should reduce but not eliminate concerns for the SRF in particular. Waste strategy and BPEO work in place to mitigate the technical concerns raised	50%	50%
	Site Characteristics	Sites are known although no detailed work has been done.	0%	0%
	Permits/Consents / Approvals	Some sites are in waste local plan so mitigated to an extent.	50%	
External Influences	Political	Non mitigatable.	0%	0%
	Economic	Non mitigatable.	0%	0%
	Legislation / Regulations	Non mitigatable.	0%	0%
	Technology	Balance specification and rigorous assessment by advisors mitigates to an extent.	50%	50%

³ The impact of the EIA will reduce the potential for environmental harm but the conduct of such a study is mandatory and thus no additional risk mitigation ascribed to the procurement actions can be determined.

Results

CapEx

The results of this assessment are that the Capital cost total optimism bias is assumed to be 46.4% for the waste services and 47.8% for the fuel use. The division between pre and post FBC OB has been estimated based on experience on other closed PFI projects, and thus one quarter of the bias is assumed to be pre FBC and 75% post FBC.

Life cycle CapEx OB is not calculated separately as there is insufficient data on waste PFI contracts that have move to completion to analytically determine the value. Therefore the same percentage as construction OB is used.

OpEx

This estimate is based on experience provide in other OBCs and is set at a total 25% using 20/80% split pre and post FBC.

Transaction

These estimates were provided by Ernst & Young on the basis of experience from other relevant PFI projects.

3rd Party revenue

The revenue in the reference case is based principally on the electricity income and heat income as the MRF and AD plant are assumed to be outside of the PFI contract. The OB is estimated as follows:

Waste services

	Base price	Units	% of income	Estimate of variance	Weighted impact
Electricity base prices	£38/MWh	0.075/t	30%	20%	6%
ROC able income	£71.52/MWh	0.075/t	57%	20%	11%
Other recyclates	£20/t	6% of input	13%	90%	12%
Total					29%

Fuel use

Electricity base prices	£38/MWh	0.740/t	67%	20%	13%
ROC able income	£12.25/ROC	111,296 ROCs	30%	100%	30%
Heat income	£2.4/MWh	0.65/t	4%	100%	4%
Electricity base prices	£38/MWh	0.740/t	67%	20%	13%
Total					47%

The rationale for the 100% variance for ROCs and heat for the fuel use contract is determined on the potential for heat markets to be unavailable and thus ROCs would also be lost. Therefore, the OB for the waste services contract is as follows:

Cost centre	Overall OB%	Pre-FBC OB %	Post FBC OB %
CapEx	46.4	11.4	35.0
Life Cycle CapEX	46.4	11.4	35.0
OpEx non-employment	25	5	20
Transaction	50	10	40
3rd Party revenue	29.1	7.1	22

And the OB for the SRF fuel use contract is

Cost centre	Overall OB%	Pre-FBC OB %	Post FBC OB %
CapEx	47.8	12.0	35.8
Life Cycle CapEX	47.8	12.0	35.8
OpEx non-employment	25	5	20
Transaction	50	10	40
3rd Party revenue	46.6	11.6	35