

# Economic regulation of NATS (En Route) plc: Appendices to initial proposals for the next price control review (“NR23”)

CAP2394b



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# Contents

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<b>Appendix A: Legal and Regulatory Frameworks</b>	<b>5</b>
Introduction	5
TA00 duties	5
UK's International Obligations (section 2(2)(d) TA00)	7
<b>Appendix B: Abbreviations</b>	<b>8</b>
<b>Appendix C: Cost of Capital</b>	<b>12</b>
Introduction	12
Risk free rate	14
Gearing	17
Equity, Debt and Asset Beta	20
Total market return	31
Cost of Embedded Debt	34
Cost of New Debt	37
Issuance and liquidity costs	39
Sensitivity of the WACC estimate to our gearing assumption	39
Choice of a point estimate	41
Alternative scenario	43
<b>Appendix D: Service quality</b>	<b>46</b>
Environment	46
Capacity	54
Summary of service quality targets and incentives	61
<b>Appendix E: Reconciliation</b>	<b>63</b>
Introduction	63
Context and NERL views	63
Our views	64
Initial Proposals	66
<b>Appendix F: Affordability</b>	<b>67</b>
Introduction	67

## Contents

The link between affordability and our statutory duties	68
NR23 charges in NERL's business plan	69
Approach to affordability analysis	70
Assessing the affordability of our Initial Proposals	72
Our Initial Proposals	79
<b>Appendix G: The capex engagement incentive</b>	<b>81</b>
Background	81
How the capex engagement incentive has worked during RP3	82
Egis' review of the engagement incentive	84
Summary of Egis' recommendations	84
Initial Proposals	86
Next steps and views invited	93

## APPENDIX A

# Legal and Regulatory Frameworks

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## Introduction

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- A1 This appendix summarises the legal and regulatory frameworks which apply to the economic regulation of NERL.
- A2 The CAA is a public corporation established<sup>1</sup> to act as the UK's independent aviation regulator, with civil aviation regulatory functions (economic regulation, airspace policy, safety regulation, consumer protection and aviation security regulation) being integrated within a single specialist body. As well as our responsibilities for aviation safety and consumer protection, we act as the economic regulator of certain UK airports and of air traffic services.
- A3 Chapter I of the TA00 provides for the economic regulation of air traffic services. NERL is currently the only licence holder under the TA00. Our approach to economic regulation includes price controls, given effect through conditions in NERL's licence, where we specify the maximum amounts that NERL can charge its customers for its regulated services. These amounts depend on how NERL performs against performance targets.

## TA00 duties

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- A4 As explained in the relevant chapters, our Initial Proposals have been formulated on the basis of the CAA's general duties set out in section 2 of the TA00.
- A5 The CAA's 'primary duty' is as follows:  
  
*"The CAA must exercise its functions under this Chapter so as to maintain a high standard of safety in the provision of air traffic services; and that duty is to have priority over the application of subsections (2) to (5)."*<sup>2</sup>
- A6 With respect to safety, most aviation regulation and policy is harmonised across the world to ensure consistent levels of safety and consumer protection. Worldwide safety regulations are set by ICAO. Throughout the development of these NR23 Initial Proposals, the CAA's economic regulation and safety teams have worked together to ensure that these proposals are consistent with the CAA's primary duty.

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<sup>1</sup> See section 2, Civil Aviation Act 1982 (<https://www.legislation.gov.uk/ukpga/1982/16/section/2>)

<sup>2</sup> Sub-section 2(1) TA00

- A7 The 'secondary duties' over which the primary duty has priority are set out in subsections 2(2) to 2(5) TA00:
- Subsection 2(2) TA00 provides that the CAA must exercise its functions under Chapter I of the TA00 in the manner it thinks best calculated:
    - to further the interests of operators and owners of aircraft, owners and managers of aerodromes, persons travelling in aircraft and persons with rights in property carried in them (referred to as "customers and consumers" in our Initial Proposals). Sub-sections 2(3) and 2(4) further provide that:
      - the only interests to be considered are interests regarding the range, availability, continuity, cost and quality of air traffic services;<sup>3</sup>
      - the reference to "furthering interests" includes a reference to furthering them (where the CAA thinks it appropriate) by promoting competition in the provision of air traffic services;<sup>4</sup>
    - to promote efficiency and economy on the part of licence holders;
    - to secure that licence holders will not find it unduly difficult to finance activities authorised by their licences. We interpret this as referring to financeability of the notionally financed company;
    - to take account of any international obligations of the UK notified to the CAA by the Secretary of State (whatever the time or purpose of the notification). See further below;
    - to take account of any guidance on environmental objectives given to the CAA by the Secretary of State. It should be noted that no such guidance has been given to the CAA by the Secretary of State.
  - Sub-section 2(5) TA00 provides that if, in a particular case, there is a conflict in the application of the secondary duties noted above, the CAA must, in relation to that case, apply them in the manner it thinks reasonable having regard to them as a whole.
- A8 Sub-section 2(6) TA00 provides that the CAA must exercise its functions under Chapter I of the TA00 so as to impose on licence holders the minimum restrictions which are consistent with the exercise of those functions.
- A9 The TA00 also places duties on NERL as a licence holder. It must:<sup>5</sup>

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<sup>3</sup> Sub-section 2(3) TA00

<sup>4</sup> Sub-section 2(4) TA00

<sup>5</sup> Sub-section 8(1) TA00

- secure that a safe system for the provision of authorised air traffic services in respect of a licensed area is provided, developed and maintained;<sup>6</sup>
- take all reasonable steps to secure that the system is also efficient and coordinated;
- take all reasonable steps to secure that the demand for authorised air traffic services in respect of a licensed area is met;
- have regard, in providing, developing and maintaining the system, to the demands which are likely to be placed on it in the future.

## **UK's International Obligations (section 2(2)(d) TA00)**

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A10 As required by section 2(2)(d) TA00, in developing our proposals, the CAA has taken account of the UK's international obligations which have been notified to the CAA by the SoS. These include:

- Article 15 of the Chicago Convention 1944;
- the Eurocontrol Multilateral Agreement relating to Route Charges 1981 (the Multilateral Agreement);
- air services agreements and provisions relating to the imposition of charges on airlines for the provision of air traffic services in agreements between the UK and third countries; and
- agreements between the UK and Republic of Ireland on parts of the Atlantic Ocean.

## **UK Performance Plan**

A11 The UK and the other Contracting States to the Multilateral Agreement have agreed to adopt a common policy in respect of the calculation of the charges and of their cost-base, which is set out in the Eurocontrol Principles.<sup>7</sup>

A12 Under the Eurocontrol Principles, Contracting States following the determined costs method (as the UK does) are required, amongst other things, to have a performance plan. The Eurocontrol Principles do not prescribe in detail what needs to be included in a performance plan and nor do they set out a procedure for its adoption. We engaged with stakeholders on the proposed scope and procedure for adoption of the UK NR23 performance plan in July 2021.

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<sup>6</sup> Sub-section 8(3) TA00 explains that for the purposes of sub-section 8(1)(a), a system for the provision of services is safe if (and only if) in providing the services the person who provides them complies with such requirements as are imposed by the Air Navigation Orders with regard to their provision

<sup>7</sup> Eurocontrol Principles dated January 2020 (EN): <https://www.eurocontrol.int/sites/default/files/2019-12/doc-20.60.01-eurocontrol-principles-january-2020-en.pdf>

## APPENDIX B

## Abbreviations

Abbreviation	Term
AICR	adjusted interest coverage rate
ADP	Aéroports de Paris
ANSP	Air Navigation Service Provider
ATSA	Air traffic assistant
ATC	air traffic control
ATCO	Air Traffic Controller
ATCE	Air traffic engineers
ATFM	air traffic flow management
ATS	air traffic services
ACOG	Airspace Change Organising Group
ACP	Airspace Change Proposal
ACOMS	Airspace Coordination and Obstacle Management Service
AMS	Airspace Modernisation Strategy
ADS-B	automatic dependent surveillance
AWE	Average weekly earnings
CAAPS	CAA Pension Scheme
CAPM	Capital Asset Pricing Model
capex	capital expenditure
CSU	chargeable service units
CAA	Civil Aviation Authority
CMA	Competition and Markets Authority
CMA determination	Competition and Markets Authority determination on Reference Period 3

CAGR	compound annual growth rate
CPI	Consumer Price Index
CDO	Continuous Descent Operations
Contracting States	Contracting States to the Multilateral Agreement on Route Charges
CCWG	Customer Consultation Working Group
decision on NERL's licence	Decision: the decision taken by the CAA to amend NERL's licence to implement the NERL components of the NR23 price control
final performance plan decision	Decision: the final decision taken by the CAA in Q1 2023 on the UK's NR23 performance plan
DB	defined benefit
DC	defined contribution
DIWE	demonstrably inefficient or wasteful expenditure
DfT	Department for Transport
DUC	Determined Unit Cost
CRCO	Eurocontrol Central Route Charges Office
the Multilateral Agreement	Eurocontrol Multilateral Agreement relating to Route Charges 1981
the Eurocontrol Principles	Eurocontrol Principles for establishing the cost base for en route charges and the calculation of unit rates
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FIR	Flight Information Region
Flint	Flint Global
FTE	full-time equivalent
FFO	Funds from Operations
FMARS	Future Military Area Radar Service
GAD	Government Actuary's Department
HAL	Heathrow Airport Limited

ILGs	index-linked gilts
ICAO	International Civil Aviation Organisation
IMF	International Monetary Fund
IFR	Instrument Flight Rules
iSIP21	Interim Service & Investment Plan 2021
iSIP22	Interim Service & Investment Plan 2022
IRR	Internal Rate of Return
MoD	Ministry of Defence
NERL	NATS (En Route) plc
NR23	NERL regulatory review 23 (2023 to 2027)
NSL	NATS Services Limited
the NERL licence	NERL's air traffic services licence
NERL's business plan	NERL's NR23 business plan
NOP	Network Operations Plan
NWR	Network Weather Resilience
OBR	Office for Budget Responsibility
opex	operating expenditure
OFF	Opex Flexibility Fund
PBO	Pensions Benefit Obligation
PCA	pension cash alternative
PCM	price control model
PR19	Ofwat's 2019 price review of regulated water companies
RRA	Redeployment & Redundancy Agreement
RP2	Reference Period 2 (2015 to 2019)
RP3	Reference Period 3 (2020 to 2022)
RAB	regulatory asset base
RPI	Retail Price Index

reconciliation review	review: the CAA review of NERL's efficient costs in 2020 to 2022
RfR	risk-free rate
RIIO-2	Ofgem's Network price controls and performance 2021-2028
RIM	rolling incentive mechanism
SARG	the CAA's Safety and Airspace Regulation Group
SoS	Secretary of State
SIP	Service and Investment Plan
SES	Single European Sky
SESAR	Single European Sky ATM Research
ADS-B	space-based automatic dependent surveillance
SOC	Standard Occupational Classification
SWIM	System Wide Information Management
TMR	Total Market Return
TSU	total service unit
TATC	Trainee air traffic controller
TRS	traffic risk sharing
TRS revenues	The revenue NERL is permitted to recover through the functioning of the TRS mechanism, as a result of unexpected variations in traffic levels. With the impact of covid-19, there are special arrangements to TRS revenues to be recovered over an extended period.
TATC	Trainee air traffic controller
TA00	the Transport Act 2000
UTM	Unmanned Aircraft System Traffic Management
VR	voluntary redundancy
WACC	weighted average cost of capital
WBS	Whole Business Securitisation
WAFS	World Area Forecast System

## APPENDIX C

# Cost of Capital

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## Introduction

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- C1 The weighted average cost of capital or WACC is a key component in setting NERL's revenue under the price control. It compensates NERL's debt and equity investors for committing capital and bearing the risk associated with financing NERL's activities.
- C2 The WACC is multiplied by NERL's average RAB to estimate NERL's allowed return. Setting an appropriate WACC furthers the interests of consumers by helping to ensure that:
- NERL is able to finance the investments it needs to carry out its activities consistent with our duty under the TA00; and
  - users of regulated services do not overpay for the services received.
- C3 The WACC is calculated as a weighted average of the cost of equity and the cost of debt. The weights we assign to each are based on the proportion of debt and equity that we assume the notional company has in its financial structure (as discussed in chapter 5). We refer to this as the "notional" financial structure.
- C4 The cost of equity represents the expected return that the shareholders in a notionally financed ANSP would require in order to induce them to commit equity capital to the business. This expected return is not observable and so is estimated based on models that help to explain how investors value equity investments.
- C5 We have estimated the cost of equity for NERL based on the Capital Asset Pricing Model (CAPM). This model is used by economic regulators in the UK and has been used by other stakeholders in their submissions for NR23 to date. CAPM estimates the cost of equity on the basis of three parameters:
- the equity beta;
  - the risk free rate; and
  - the total market return.
- C6 The cost of debt provides NERL with an allowance to cover its efficiently incurred borrowing costs.
- C7 This appendix sets out our analysis for each of the WACC parameters for NR23:

- risk-free rate;
- gearing;
- equity, debt and asset beta;
- total market return (TMR);
- cost of existing or “embedded” debt;
- cost of new debt; and
- issuance and liquidity costs (which are part of the costs of issuing debt finance).

C8 While the above analysis of these factors as set out in this appendix is helpful in informing a plausible range for the WACC and can be used to take account of the impact of specific aspects of the price control and risk sharing arrangements, there will remain an important element of judgment in finalising our estimate of NERL’s WACC. The estimate of the WACC is ultimately a judgment taking account of the evidence and analysis, rather than a calculation using a point estimate of each parameter. This is particularly so in the context of ongoing uncertainty in the aftermath of the pandemic and in the presence of macroeconomic shocks such as higher inflation. This uncertainty requires careful consideration, but ultimately requires us to exercise our judgement when selecting a particular estimate or approach from among several plausible alternatives.

C9 We have adopted a cut-off date for the analysis of 31 March 2022. We are conscious that this cut-off date does not capture recent developments such as increases in inflation and bond yields over the summer and autumn of 2022. We have adopted this approach because there is significant uncertainty over how the current situation will evolve, which makes it difficult to reach an informed judgement regarding how to interpret recent data. We intend to revisit these issues at Final Proposals, and to take stock of the available information at that point.

C10 As discussed in chapter 5, we have reviewed a wide range of evidence to estimate an appropriate WACC for NR23, including:

- a report we commissioned from Flint Global (Flint) on the appropriate beta for NR23;
- recent market information and trends;
- recent UK regulatory precedent;
- information and supporting evidence provided by NERL.

## Risk free rate

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### Context

C11 The risk free rate (RfR) is the return required on a risk free or “zero beta” asset within the CAPM. It is an input into the CAPM, which is used to estimate the cost of equity.

### NERL

C12 Oxera, on behalf of NERL estimated the RfR based on the yield on index-linked gilts (ILGs) with a maturity of 10 years,<sup>8</sup> which was -2.80% as at the time of publication of Oxera’s October 2021\_report.<sup>9</sup> Oxera then applied two adjustments to this estimate:

- a “convenience yield” of 50bps, representing the hypothesis that “market participants have reasons to hold government bonds that go beyond the rate of return expected on these risk-free investments”.<sup>10</sup> Oxera indicated that this estimate was based on a review of “various academic studies and empirical evidence”<sup>11</sup>; and
- a forward adjustment of 22bps-77bps reflecting Oxera’s view of “*expectations of rate movements until the price control*”. This adjustment was estimated based on the forward curve for 10-year ILGS at the time of Oxera’s report.

C13 Based on the sum of these estimates, Oxera proposed a range for the RPI-real-RfR of -2.08% to -1.53%.

### Other stakeholder views

C14 British Airways stated that, “We continue to prefer the use of ILGs as a benchmark for the RfR – and note that the CMA has endorsed such an approach on the part of Ofgem. To the extent that the CAA considers it appropriate to take into account commercial rates or adjustments to gilt rates, it should cross-check the resulting implied rates and ensure that the resulting implications for airline customers are justifiable”<sup>12</sup>

C15 We did not receive responses from other airline stakeholders specifically in respect of the RfR.

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<sup>8</sup> Oxera note that ILGs with remaining maturity of 10 years were selected as this is consistent with NERL’s remaining life of assets, as estimated based on NERL’s net property, plant and equipment divided by the statutory depreciation charge.

<sup>9</sup> Oxera (2021), “*Cost of capital for NR23*”, October, p42.

<sup>10</sup> Oxera (2021), “*Cost of capital for NR23*”, October, p41.

<sup>11</sup> Oxera (2021), Op. Cit.

<sup>12</sup> British Airways, “British Airways response to NR23 Business Plan Economic Regulation of NATS En Route plc,” 10 March 2022, page 25.

## Our views

- C16 We set out below our views on the following issues:
- the appropriate tenor of the reference instruments;
  - the period over which we should average yields on reference instruments;
  - whether or not a convenience yield is warranted and the appropriate scale of any adjustment; and
  - whether or not we should apply a forward adjustment.

### Tenor Period

- C17 We agree with Oxera that the appropriate tenor of reference instruments is 10 years, reflecting NERL's average asset life based on its latest financial statements. We therefore estimate the RfR using 10-year maturity ILGs. This is consistent with the CMA's approach at RP3, which was based on *"10-year ILG data provided by the Bank of England, cross checked against yields on 10-20 year maturity ILGs and against 3 and 6 month historic averages."*<sup>713</sup>

### Averaging period

- C18 There is a trade-off between relevancy (for example, including data which is not reflective of future market conditions) versus randomness and volatility (for example, relying on a smaller number of data points potentially increases volatility) when selecting an averaging period. A 1-month trailing average of the yields on the reference instruments appropriately balances these considerations, as it includes the most recent data prior to our cut-off date but avoids placing too much weight on a single data point which could introduce volatility. This approach is consistent with our own approach for H7 Final Proposals.

### Convenience Yield

- C19 We share Oxera's concern that the yield on ILGs could reflect factors other than expected return on these instruments. We therefore consider that we should place some weight on an estimate of the RfR that includes an estimated convenience yield. This is consistent with the position we adopted in our Final Proposals for H7.
- C20 We have estimated the convenience yield that we should apply for NR23. This is based on the same approach we used for H7 Final Proposals but adjusted to reflect the use of instruments with 10 years to maturity instead of 20 years.
- C21 We estimate the convenience yield by estimating the difference between the yield on the iBoxx AAA 10-15 non-gilts index (the same index used by the CMA

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<sup>13</sup> Competition and Markets Authority (2020), "NATS (En Route) Plc / CAA Regulatory Appeal: Provisional findings report", paragraph 12.258.

in the PR19 determinations<sup>8</sup>) and nominal gilts of a similar maturity.<sup>9</sup><sup>14</sup> This allows us to control for various factors such as any inflation risk premium and maturity premiums embedded within the yield on the AAA index. A similar approach was adopted by NERL's advisors, Oxera, when they previously estimated the convenience yield.<sup>15</sup>

C22 We estimate the 1-month average convenience yield is 37bp. We use a 1-month average to be consistent with our averaging period for gilts.

#### Use of a forward adjustment

C23 We disagree with Oxera that it is appropriate to apply a forward adjustment. As we have indicated in our H7 Initial and Final Proposals, we do not consider that forward rates are good predictors of future spot rates. We consider that today's spot rate is the best predictor of future interest rates and this is consistent with the CMA's PR19 determination, which did not apply a forward adjustment.

C24 As such, we do not apply a forward adjustment for the purposes of estimating the RfR for NR23.

#### Our Initial Proposals

C25 We propose to estimate the RfR as the simple average of the following values:

- The 1-month trailing average yields on 10-year ILGs to 31<sup>st</sup> March 2022 is -2.78%; and
- The 1-month trailing average yields on 10-year ILGs to [31<sup>st</sup> March 2022] uplifted using a convenience yield of [37bps], which equals [-2.41%].

C26 This implies a RfR range of -2.78% to -2.41% with a midpoint of **-2.60%, RPI-deflated.**

C27 The midpoint is 57 bps lower than the RfR proposed in H7 of -2.03%. This is due to the use of longer-maturity gilts under the H7 approach, which we consider is consistent with HAL's longer average asset life compared with NERL. In all other respects, our approach for NR23 is consistent with our approach for H7.

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<sup>14</sup> The AAA index used varies in maturity over time, to isolate any effects associated with maturity we choose a gilt maturity closest to the nearest half year at that point in time. For example, if the maturity on the AAA index was 12.4 years, we would subtract the yield on 12-year nominal gilt to estimate the convenience yield.

<sup>15</sup> Oxera convenience yield report <https://www.oxera.com/wp-content/uploads/2020/08/2020.05.20-RFR-and-gearing-1.pdf>

## Gearing

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### Context

- C28 Gearing reflects the amount of debt within a company's capital structure. There are several definitions available for gearing. For the purposes of estimating NERL's WACC we use a definition of gearing that is based on net debt divided by RAB.
- C29 When discussing gearing, we focus on the gearing of the notional company (known as "notional gearing") and not the actual company.
- C30 We use gearing both in estimating the WACC and in the financial modelling that we use to test NERL's financeability, making different assumptions on the appropriate level of gearing to reflect the different time horizons of the WACC and financial modelling calculations.
- C31 For RP3, we used a notional gearing assumption of 60% for setting the allowed return and used a starting value of around 40% when modelling the gearing of the notional company for the purposes of testing financeability.<sup>16</sup> Our assumption was informed by NERL's proposals as part of its RP3 business plan and our financeability assessment at RP3.
- C32 The CMA adopted a notional gearing assumption of 30% for NERL as part of the RP3 determination and its average modelled gearing during RP3 was 33%.<sup>17</sup> CMA's notional gearing assumption was informed by the average gearing of the comparators used to estimate beta.<sup>18</sup> The CMA chose this value as it noted that a higher notional gearing assumption resulted in a higher WACC based on the parameter assumptions it had made at that time.<sup>19</sup> The CMA said that setting a higher gearing was not in NERL's customers' best interests under these circumstances.<sup>20</sup>

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<sup>16</sup> <https://publicapps.caa.co.uk/docs/33/CAP%201830a%20appendices.pdf> p49 and <https://publicapps.caa.co.uk/docs/33/CAP%201830%20CAA%20Decision%20Doc.pdf> p108.

<sup>17</sup> [https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS\\_-\\_CAA\\_final\\_report\\_for\\_publication\\_August\\_2020\\_-----.pdf](https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS_-_CAA_final_report_for_publication_August_2020_-----.pdf) para 13.311.

<sup>18</sup> [https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS\\_-\\_CAA\\_final\\_report\\_for\\_publication\\_August\\_2020\\_-----.pdf](https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS_-_CAA_final_report_for_publication_August_2020_-----.pdf) pp198-201.

<sup>19</sup> [https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS\\_-\\_CAA\\_final\\_report\\_for\\_publication\\_August\\_2020\\_-----.pdf](https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS_-_CAA_final_report_for_publication_August_2020_-----.pdf) pp198-201.

<sup>20</sup> [https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS\\_-\\_CAA\\_final\\_report\\_for\\_publication\\_August\\_2020\\_-----.pdf](https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS_-_CAA_final_report_for_publication_August_2020_-----.pdf) pp198-201.

- C33 A further relevant consideration with respect to determining the notional gearing level is that NERL's licence includes a condition which requires it to maintain a gearing level below 65%.<sup>21</sup>

## NERL

- C34 NERL's advisors Oxera used a notional gearing of 50% in estimating its WACC.<sup>22</sup> This reflected the CMA's notional gearing from RP3 (30%) plus the change in the gearing of the comparators used to estimate beta, as well as the change in NERL's own gearing of around 20% resulting from the covid-19 pandemic.<sup>23</sup>
- C35 Oxera estimated the impact of changes in notional gearing on the WACC as part of its report for NERL in line with the CMA's analysis at RP3.<sup>24</sup> They found that the choice of gearing has little impact on the WACC based on its chosen parameters so suggested there was no need to adopt the approach used by the CMA at PR19 (that is, to set notional gearing equal to comparators' gearing).<sup>25</sup>

## Other stakeholder views

- C36 British Airways has suggested that we should evaluate if the WACC can be estimated directly for comparators, and have questioned how we would justify a higher WACC based on a different gearing assumption as being in the overall interest of passengers.<sup>26</sup>
- C37 British Airways has also proposed that we estimate a plausible and prudent forward-looking long-term gearing assumption for NERL.<sup>27</sup>

## Our views

- C38 The precedent set by the CMA on notional gearing from RP3 appears to be clear and appropriate: the notional gearing for NERL should be based on the observed gearing for the listed companies that are most comparable to NERL. To ensure consistency with the estimation of the cost of equity, these companies should be the same as those used to estimate the asset beta. For NR23, we have selected AENA, Fraport and Aeroports de Paris (ADP) as comparators for NERL. We have also considered the gearing for ENAV as a cross-check (given that it is

<sup>21</sup> NERL licence p.32-37

[https://publicapps.caa.co.uk/docs/33/NERL%20LICENCE%2018%20\(October%2021\).pdf](https://publicapps.caa.co.uk/docs/33/NERL%20LICENCE%2018%20(October%2021).pdf)

<sup>22</sup> Oxera (2021), "Cost of capital for NR23", October, pp50-52

<sup>23</sup> Oxera (2021), "Cost of capital for NR23", October, pp50-52

<sup>24</sup> Oxera (2021), "Cost of capital for NR23", October, pp52-54

<sup>25</sup> Oxera (2021), "Cost of capital for NR23", October, pp52-54

<sup>26</sup> British Airways, "British Airways response to NR23 Business Plan Economic Regulation of NATS En Route plc," 10 March 2022, page 26.

<sup>27</sup> British Airways, "British Airways response to NR23 Business Plan Economic Regulation of NATS En Route plc," 10 March 2022, page 26.

also a listed ANSP), but we have not directly used ENAV's gearing to inform our gearing assessment for NR23.

- C39 To ensure further consistency with our beta estimates, we propose to use a long-run value of gearing to estimate the WACC reflecting the impact of the pandemic on capital structures. We estimate the gearing for NR23 by comparing the pre-pandemic and post-pandemic gearing for comparator airports. We then re-weight these gearing figures using the same approach used by Flint in their report on beta (assuming a pandemic will occur once every 20 to 50 years with a duration of between 17 to 39 months).
- C40 We estimate that the pre-pandemic gearing for the airport comparators is equal to 29.4%, which is consistent with the CMA's finding for RP3. We estimate that the pandemic has led to an increase in comparator gearing levels of around 12%. Consistent with our approach towards estimating the asset beta, we have assumed that in future, NERL will exhibit gearing consistent with the pre-pandemic level for comparators during "benign" periods, and consistent with their 2020-2022 level during "pandemic-like" periods. These assumptions imply an average long-run gearing level that is 0.6% to 1.3% higher than the pre-pandemic level, depending on the assumed length of future pandemic-like events: that is, 30.0% to 30.7%.
- C41 We acknowledge Oxera's analysis of the impact of gearing on the allowed return. We have recreated this table at the end of this chapter to show the sensitivity of our proposed estimate to the choice of notional gearing. We find our allowed return is more sensitive to the choice of gearing.
- C42 The notional gearing assumption we use for the purposes of estimating the WACC (c.30%) is different from the notional gearing assumption used in our assessment of financeability (c.50%). The latter reflects our view of how the notional entity will have behaved in the immediate aftermath of the pandemic, as opposed to the long-run level we apply for the purposes of estimating the WACC.
- C43 We do not consider that the use of different notional gearing assumptions in the financeability assessment and the WACC respectively present a material inconsistency. In theory the WACC of the notional entity should not be different at a higher level of notional gearing. The CMA's analysis at RP3 and our own assessment in this document suggests that the process of re-levering and de-levering distorts the estimate of the WACC due to the presence of embedded debt, rather than being indicative of a positive relationship between WACC and gearing.

## Our Initial Proposals

- C44 Based on our analysis of the comparators used to set beta, we propose to use a notional gearing of 30% for NERL in setting the WACC. This is consistent with the CMA's assumption at RP3.
- C45 As described above, we adopt a different gearing assumption for the notional company in testing financeability. The notional gearing level will impact the tax allowance we set for NERL, since it determines the size of the interest expense we deduct from the notional company's taxable profits.
- C46 In setting the level of gearing in the PCM, we have modelled gearing from the start of RP3 (2020) to reflect the outturn revenues and costs incurred during this period. This allows us to understand how the notional company's financial structure would have changed in the response to the pandemic.
- C47 We assume any cash shortfalls are met by the notional company raising debt until its gearing reaches 65% (NERL's gearing cap). Beyond this, we assume the notional company would issue equity to meet these cash shortfalls. Our starting assumption for gearing in 2020 is 30% which is consistent with the CMA's starting assumption for RP3.

## Equity, Debt and Asset Beta

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### Context

#### Equity beta

- C48 The equity beta is the only company-specific component of the CAPM. It represents the extent to which a company's stock is correlated with the market index. This is important because a stock that is highly correlated with the market index will exhibit risk that cannot be eliminated by holding a diverse stock portfolio (that is, systematic risk). Under the CAPM, a higher equity beta implies that investors require a higher expected equity return to induce them to invest in the stock.
- C49 For a listed company, the equity beta can be estimated as the coefficient in a regression of the company's stock returns against the returns on the market index. Because NERL is not a listed company, we must estimate NERL's equity beta based on the equity betas on similar, "comparator" companies

#### Asset beta

- C50 Comparator companies can exhibit significant differences in gearing, which can influence estimates of their equity beta. To control for these differences, it is common practice to estimate the "asset beta" of the comparator companies: this is broadly equivalent to the equity beta of a company if it had no debt outstanding and represents the underlying systematic risk exposure of the company's assets.

- C51 This is then converted to an estimate of NERL’s equity beta by “re-levering” comparator companies’ asset betas using our notional gearing assumption for NERL.
- C52 The process of “de-levering” and “re-levering” of comparator companies’ equity betas has been controversial in the past. At RP3, the CMA noted that this process gave rise to an apparently positive relationship between the WACC and the notional gearing level, which contradicted the Modigliani-Miller irrelevance proposition: an important tenet of corporate finance theory. In order to avoid this issue, the CMA assumed a notional gearing level for NERL that was close to that of comparator companies, which minimised the impact of re-levering and de-levering. We have adopted a similar approach for these Initial Proposals. We nonetheless continue to de-lever comparator equity betas at their observed gearing levels, and re-lever at our assumed notional gearing level for NERL.

#### Debt beta

- C53 The debt beta represents the proportion of a company’s systematic risk exposure that is attributable to debt. A company’s asset beta can be defined in terms of the following formula:

$$\text{Asset beta} = \text{gearing} \times \text{debt beta} + (1 - \text{gearing}) \times \text{equity beta}$$

- C54 Rearranging the formula above demonstrates that the equity beta is a function of a company’s asset beta, its gearing and its debt beta:

$$\text{Equity beta} = (\text{asset beta} - \text{gearing} \times \text{debt beta}) / (1 - \text{gearing})$$

- C55 The debt beta is, therefore, a necessary input when de-levering and re-levering the equity beta. When a company is partly financed with debt, attributing the systematic risk exposure of the company entirely to equity will generally overstate the company’s equity risk, since some of this risk will be borne by creditors.
- C56 Debt beta is correlated with maturity, systematic risk of the company, gearing and debt specific characteristics (for example, securitisation).<sup>28</sup> These factors can be proxied through a debt instrument’s credit rating. Debt beta can be estimated using a variety of methods including econometric and theoretical approaches.<sup>29</sup>

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<sup>28</sup> [https://www.cepa.co.uk/images/uploads/documents/CEPARReport\\_UKRN\\_DebtBeta\\_Final.pdf](https://www.cepa.co.uk/images/uploads/documents/CEPARReport_UKRN_DebtBeta_Final.pdf) p5.

<sup>29</sup> For a summary of methods see [https://www.cepa.co.uk/images/uploads/documents/CEPARReport\\_UKRN\\_DebtBeta\\_Final.pdf](https://www.cepa.co.uk/images/uploads/documents/CEPARReport_UKRN_DebtBeta_Final.pdf)

**NERL**

C57 Oxera, on behalf of NERL, have estimated an asset beta range of 0.60-0.70,<sup>30</sup> and a debt beta of 0.05. There are various elements underpinning Oxera's approach, which we summarise below.

**Comparator equity betas – choice of comparators**

C58 Oxera considers that both airports and ANSPs represent the most appropriate comparators for NERL, on the basis that, "the underlying driver of revenue for airports and air navigation service providers is demand for air travel and, hence, despite the differences in business mix, airports are sufficiently similar to be included in the beta comparator set."<sup>31</sup>

C59 Alongside the only listed European ANSP – ENAV<sup>32</sup> – Oxera considers eight potential airport comparators: AENA<sup>33</sup>, ADP<sup>34</sup>, Auckland, Copenhagen, Fraport<sup>35</sup>, Sydney, Vienna and Zurich<sup>36</sup>. It then excludes four of these companies:

- Sydney and Auckland are excluded due to differences in geography, regulatory regime and Oxera's view that these airports are likely to have been affected differently by the pandemic compared with NERL; and
- Copenhagen and Vienna are excluded as Oxera considers that they have significantly lower free float and higher bid-ask spreads than the other operators. Oxera considers that this implies that the stocks are considerably less liquid, which could lead to a downward biased equity beta.

C60 Of these comparators, Oxera places the most weight on ENAV as:

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<sup>30</sup> Oxera also note that "a higher beta range may be warranted for NR23 if the current beta levels persist over the remaining 12 to 1 months preceding the CAA's final determination.", see Oxera (2021), "Cost of capital for NR23", October, p37.

<sup>31</sup> Oxera (2021), "Cost of capital for NR23", October, p13.

<sup>32</sup> ENAV S.p.A. is an Italian company that is responsible for the provision of air traffic services and other air navigation services in Italy.

<sup>33</sup> AENA is a Spanish company that owns a portfolio of airports in Spain and internationally. These include Madrid Barajas and Barcelona airports, which are the largest airports in its portfolio.

<sup>34</sup> Groupe ADP is a French international airport operator. It owns Charles De Gaulle Airport in Paris, alongside a portfolio of other French and international airports.

<sup>35</sup> Fraport is a German company that owns and operates a portfolio of airports in Germany and internationally. These include Frankfurt Airport, which is Germany's largest airport and the largest airport in Fraport's portfolio.

<sup>36</sup> Flughafen Zürich AG is a Swiss company that owns a portfolio of airports, including Zurich Airport, which is Switzerland's largest airport and the largest airport in Flughafen Zürich AG's portfolio.

- Oxera considers that it is exposed to a similar degree of regulatory uncertainty regarding the recovery of unearned revenues during the pandemic; and
- ENAV, like NERL, exhibits a smaller operating margin than airports, meaning that a demand shock would reduce NERL's equity return to a greater extent than airport comparators.

C61 Oxera has noted that its implied asset beta range for NERL lies below the range implied by their estimates for ENAV.

C62 Oxera does not place any weight on UK water and energy network companies, in line with the CMA's view in the context of the RP3 determination.

#### Comparator equity betas – measurement period, frequency and estimator

C63 Oxera has considered various measurement periods (one-year, two-year and five-year) and frequencies (daily and weekly).

C64 It has not considered rolling windows, on the basis that these assign inconsistent weights to different time periods.

C65 It has also not assumed any degree of “reversion” of estimated equity betas over the above periods towards their pre-pandemic level, on the basis that this would not be consistent with the trends that analysts, commentators, and regulators have identified – and their view that unadjusted betas reflect the best available information regarding future systematic risk exposure.

#### Debt beta

C66 Oxera propose the use of a debt beta assumption of 0.05, both for de-levering comparator equity betas and to re-lever NERL's asset beta. They note that this approach is in line with the CMA's approach at RP3.

#### Equity beta

C67 Based on a notional gearing assumption of 50%, Oxera estimate an equity beta range for NR23 of 1.15 to 1.35.

#### Other stakeholder views

C68 British Airways has expressed various concerns with Oxera and NERL's approach with respect to the estimate of the asset beta.

C69 British Airways's principal concern is the measurement period and weights applied to different periods when estimating the asset beta. British Airways has proposed an approach similar to that adopted by the advisors (CEPA) to the Airline Operators Committee and London (Heathrow) Airline Consultative Committee in the context of the H7 price control, based on estimating the asset beta for NR23 as a weighted average of:

- A pre-pandemic asset beta based on data from before February 2020; and

- A pandemic asset beta based on data after this date.

C70 The weights would be determined based on the expected frequency of future pandemics.

C71 British Airways considers that “NERL’s proposed cost of capital allowance does not reflect a balanced and complete assessment of the available evidence on aviation sector asset betas in light of the impact of Covid-19 on the sector”<sup>37</sup>, and that its preferred approach would result in a significantly lower asset beta.

C72 British Airways provide the following illustrative example. Using a stock beta prior to the crisis of 0.5, and the asset beta during the crisis of 0.8, and given that pandemics are expected to recur every thirty years with a two-year period of heightened sensitivity, British Airways obtain an asset estimate of 0.52.

#### Length of estimation window

C73 British Airways considers that Oxera has relied on a relatively long estimation window (five years) which risks giving undue weight to outlier data points generated during a period of time that is quite distinct from the period that preceded it.

C74 Use of a pooled sample including both pandemic and non-pandemic datapoints – British Airways considers that it is not appropriate to use Ordinary Least Squares on a pooled sample spanning two periods in which beta is assumed to have changed markedly.

#### Interpretation of pandemic-period beta estimates

C75 British Airways disagrees with Oxera’s interpretation of pandemic-period asset beta estimates as being representative of fundamental re-assessment of companies’ systematic risk exposure. British Airways suggests that this approach underweights datapoints prior to the covid-19 crisis, which they view as relevant going forward.

#### Selection of comparators

C76 British Airways view Oxera’s approach to selecting comparators (using geography and liquidity of the stock) is unnecessarily restrictive.

#### Our views

C77 We have carefully considered NERL’s approach to estimating its asset beta. To inform our view, we commissioned a report from Flint on the estimate of the asset beta for NERL. This is published alongside this document.

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<sup>37</sup> British Airways (2022), “British Airways response to NR23 Business Plan: Economic regulation of NATS En Route plc”, March, paragraph 7.59.

- C78 We propose to follow the approach set out by Flint in its report, which is to:
- estimate the equity betas for comparator companies based on a dataset spanning both pandemic and pre-pandemic periods;
  - assume that comparator companies will exhibit equity beta dynamics similar to that observed during the 2020-2022 pandemic in the context of future “pandemic-like events”;
  - assume that comparator companies will exhibit equity beta dynamics similar to that observed prior to the pandemic during future “benign” (that is, non-pandemic) periods; and therefore
  - weight observations from the pandemic period based on our assessment of the frequency and duration of future pandemic-like events.
- C79 This approach neither ignores pre-pandemic data nor artificially bounds or restates the actual pandemic data.
- C80 As set out in our H7 Final Proposals, we disagree with British Airways’ proposed approach of estimating the beta as the weighted average of two separately estimated betas from the pre-pandemic and pandemic periods respectively.

#### Assumed frequency of a future pandemic-type event

- C81 It is not straightforward to estimate the frequency of future pandemic-type events. Under these circumstances we consider that the most prudent approach is to adopt a range of plausible assumptions.
- C82 Flint has adopted the same frequency as used in H7 (that is, it has assumed a range of a pandemic-type event occurring once every 20 to 50 years).

#### Selection of comparators

- C83 We have worked with Flint to carry out a detailed comparative assessment of NERL’s potential comparators. Flint’s starting position considers nine potential comparators: ENAV, ADP, Fraport, AENA, Auckland, Copenhagen, Sydney, Vienna and Zurich.
- C84 Flint’s analysis suggests that Copenhagen and Auckland airports’ equity beta could not be estimated reliably, therefore, we do not place any weight on these comparators. They exclude Sydney and Vienna because they operate under price controls which are not comparable to NERL’s.
- C85 Finally, Flint also exclude Zurich on the basis that it is relatively small compared to the remaining airports: ADP, Fraport and AENA. In summary, we have placed weight on four comparators: ENAV, ADP, Fraport and AENA.

### Relevance of CMA determination

- C86 In its report, Flint has used the asset beta calculated by the CMA determination as its baseline beta.
- C87 The CMA's determination represents an appropriate starting point for our assessment. Our approach then adjusts this baseline beta to take account of significant new information that has emerged – most importantly in respect of the pandemic – since the CMA conducted its assessment. We consider that this approach is consistent with and builds on the CMA's approach.

### Debt Beta

- C88 The CMA estimated a debt beta of 0.05 for RP3 based on a range of evidence including econometric analysis.<sup>38</sup> Since the RP3 determination, the CMA undertook a more in-depth review of debt beta as part of the PR19 determination, estimating a range of 0.05 to 0.10 for the water companies.<sup>39</sup>
- C89 Debt beta is complicated to estimate due to the quality of the data associated with bonds. For example, corporate bonds are more illiquid than shares which impacts the ability to apply the same techniques used for estimating equity betas to estimating debt beta.
- C90 Given the in-depth review undertaken at PR19, and the issues with estimating debt beta accurately, we propose not to undertake a detailed assessment of debt beta and focus on what has changed since RP3 in setting a debt beta for NR23.
- C91 We are cognisant of setting a debt beta which is consistent with our approach to setting asset beta (that is, that it should place an appropriate weight on pre-pandemic data and post-pandemic data and be based on long-run beta estimation). We have balanced these considerations in setting debt beta.

### Our Initial Proposals

- C92 We set out below our proposed approach for estimating the asset beta for NR23, which relies on the findings of the Flint report, including our views on:
- NERL's pre-pandemic asset beta (including the effect or regulatory mitigations (such as the TRS mechanism which were in place for NERL prior to the pandemic);
  - The impact of the pandemic on NERL's asset beta, which is the COVID-19 adjustment.

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<sup>38</sup> [https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS\\_-\\_CAA\\_final\\_report\\_for\\_publication\\_August\\_2020\\_----.pdf](https://assets.publishing.service.gov.uk/media/5f350e17e90e0732e0f31c2a/NATS_-_CAA_final_report_for_publication_August_2020_----.pdf), p203.

<sup>39</sup> [https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final\\_Report\\_---\\_web\\_version\\_-\\_CMA.pdf](https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf), p880.

C93 We then combine these estimates to arrive at a view of the asset beta for NR23.

#### Pre-pandemic asset beta

C94 In its report, Flint assume an asset beta of 0.52 to 0.62 for NERL's pre-pandemic beta, which was based on the asset beta calculated by the CMA during the RP3 determination.

**Table C.1: Summary of CMA RP3 determination for NERL's equity beta**

Component	Lower Bound	Upper Bound
Asset beta	0.52	0.62
Debt beta	0.05	0.05
Gearing	30%	30%
Equity beta	0.72	0.86

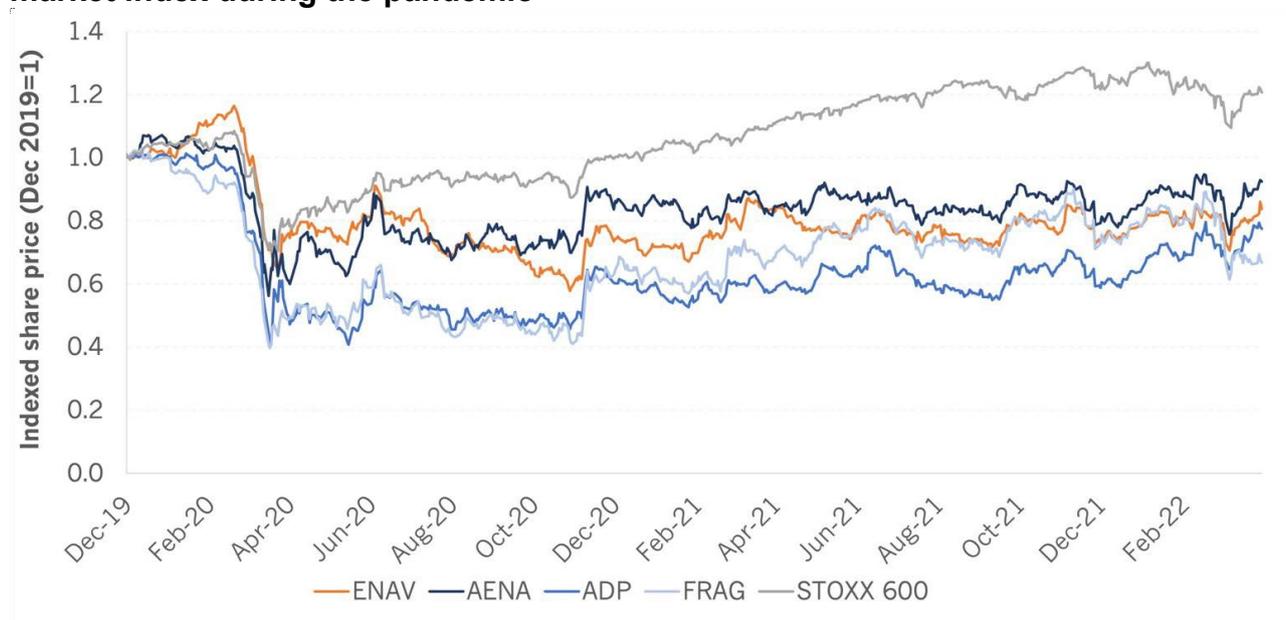
Source: CMA, "NATS En Route Plc / CAA Regulatory Appeal," page 211.

C95 We therefore propose to use 0.52 to 0.62 as the estimate of NERL's pre-pandemic beta.

#### Covid-19 adjustment

C96 The figure below illustrates share price dynamics for listed comparator companies and the market index (the EuroStoxx600).

**Figure C.1: Evolution of share prices for comparator airports and the Eurostox600 market index during the pandemic**



Source: Flint, "Support to the Civil Aviation Authority: Estimating NERL's beta at NR23," Figure 1: Aviation Infrastructure Equity Performance since December 2019, page 6.

Notes: Thomson Reuters data as of 31<sup>st</sup> March 2022.

C97 The observed data has been characterised by extreme daily market or share price movements (or both) that exhibit an unusually strong and lasting influence

on the estimated beta. This is illustrated in Flint's report in Figure 4 which shows discrete "spikes" in the short-term asset beta when the news of the pandemic arrived. For example, both airport stocks and market indices recovered sharply in November 2020 when the imminent availability of a vaccine was announced.

- C98 By contrast, we consider that it is unlikely that such conditions will persist throughout NR23, and that it is reasonable to expect that the operating environment for ANSPs will be more benign in the future<sup>40</sup>. It is likely that the post-pandemic period will be characterised by prolonged periods during which NERL's asset beta will behave in line with its pre-pandemic dynamics, with intermittent periods of pandemic-like events.
- C99 We acknowledge that the covid-19 pandemic is likely to have heightened investor perception to the risk exposure of the aviation sector, therefore suggesting that NERL's asset beta is unlikely to return to its pre-pandemic level for at least some considerable time. This implies we cannot disregard the impact of the covid-19 pandemic.
- C100 Determining the exact scale of the longer-lasting increase in NERL's asset beta is a challenging exercise as the post-pandemic period is unlikely to precisely resemble either the pandemic period or the preceding period. Furthermore, Flint's analysis suggests that the asset beta of ANSPs and airports have not behaved identically post-pandemic. The asset betas of airports have converged towards their pre-pandemic levels, whereas ENAV has remained above its pre-pandemic level. The difference in the extent of recovery of asset betas post-pandemic has further complicated the task at hand.
- C101 Flint has applied different weights to individual observations of daily share price movements based on whether they occurred within or before the covid-19 pandemic period. The weights reflect the assumed frequency with which a pandemic-type event will occur in the future.
- C102 The results of this analysis are summarised in Figures C.2 and C.3 below, which are reproduced from Flint's report. Figure C.2 sets out the asset beta estimates that emerge under different assumptions for the frequency of pandemic recurrence, and on the assumption that future pandemics will influence NERL's asset beta for 26 months.

**Table C.2: Summary of ENAV and comparator airport asset betas under different frequency assumptions, assuming a pandemic-like event duration of 26 months**

Frequency of COVID-like event	ENAV	3 airport	4 airport	6 airport
10	0.61	0.65	0.65	0.60
15	0.57	0.61	0.62	0.56

<sup>40</sup> We nonetheless anticipate that some smaller shocks will occur periodically based on historical evidence.

20	0.54	0.59	0.60	0.54
50	0.47	0.55	0.56	0.50
100	0.44	0.53	0.55	0.49
N/A	0.41	0.51	0.53	0.47

Notes: Assume debt beta of 0.05.

Source: Flint, "Support to the Civil Aviation Authority: Estimating NERL's beta at NR23," Table 3: Reweighted asset beta estimates for our assumed frequency of Covid-like events of 26 month duration, page 30.

- C103 Figure C.3 below which is reproduced from Flint's report then sets out the corresponding beta estimates on the assumption that future pandemics will influence NERL's asset beta for a longer period of 39 months.

**Table C.3: Summary of ENAV and comparator airport asset betas under different frequency assumptions, assuming a pandemic-like event duration of 39 months**

Frequency of COVID-like event	ENAV	3 Airport	4 airport	6 airport
10	0.66	0.69	0.69	0.64
15	0.61	0.65	0.65	0.60
20	0.58	0.62	0.63	0.57
50	0.50	0.56	0.58	0.52
100	0.46	0.54	0.55	0.50
N/A	0.41	0.51	0.53	0.47

Notes: Assume debt beta of 0.05.

Source: Flint, "Support to the Civil Aviation Authority: Estimating NERL's beta at NR23," Table 7: Reweighted asset beta estimates for our assumed frequency of Covid-like events of 39 month duration, page 33.

- C104 Flint has assumed a frequency of 20 to 50 years for the purpose for estimating the impact of the pandemic of NERL's asset beta, which we consider to be a prudent range. Flint suggests that the impact of the pandemic has been to increase NERL's asset beta by 0.02-0.11.

### Overall Asset Beta

- C105 Flint has proposed an overall asset beta range of 0.54 to 0.73, which consists of the baseline beta and covid-19 adjustment driven by airports as in Table C.4.

**Table C.4: Flint NR23 Asset Beta Recommendation**

	Lower Bound	Upper Bound
Baseline beta	0.52	0.62
COVID-adjustment driven by airports	0.02	0.11
COVID-adjustment driven by ENAV	0.04	0.17

Notes: Assume debt beta of 0.05.

Source: Flint, "Support to the Civil Aviation Authority: Estimating NERL's beta at NR23," Table 12: Flint NR23 Asset Beta Recommendation, page 41.

- C106 Flint has also considered the evidence in respect of ENAV's beta. However, Flint has proposed to place limited weight on ENAV's beta due to:
- The apparent instability of ENAV's beta over time prior to the pandemic compared with airport comparators; and

- The sensitivity of Flint's estimate of the pandemic impact on ENAV's beta to the inclusion or exclusion of recent data, which suggests that ENAV's beta continues to be unstable following the pandemic.

- C107 Instead, it has suggested to place greater emphasis on the covid-19 adjustment driven by the airports' comparator group.
- C108 In reaching our proposed beta range for NR23, we have considered the impact of the pandemic on NERL compared to the airport comparators. Unlike the airport comparators, NERL has substantial protections such as pension cost pass-through and a comprehensive traffic-risk sharing mechanism which helps to de-risk NERL. It is not straightforward to quantify these effects, but these important factors suggest the top of Flint's proposed range of asset beta may not be appropriate for NERL.
- C109 Flint's range based on airport data is 0.54 to 0.73. As noted above we do not consider that the top half of this range is commensurate with NERL's risk profile due to NERL's regulatory protections. Therefore, we propose to focus on the bottom half of Flint's airport range. **This results in a range of 0.54 to 0.64.**
- C110 We have cross-checked this point estimate against the implied beta for ENAV. Flint's results suggest a beta range of 0.45 to 0.58 for ENAV. In our Final Decision for RP3, we noted that NERL exhibited higher operational leverage than ENAV and considered that this could warrant an upward adjustment when estimating NERL's asset beta based on ENAV's asset beta. We considered that a 9% upwards adjustment would be appropriate<sup>41</sup>. Applying this adjustment to the ENAV beta range implies an asset beta for NERL equal to 0.49 to 0.63 based on this evidence. This suggests our proposed range based on airports is consistent with the beta implied by ANSPs.

#### Debt Beta

- C111 We propose to maintain the debt beta assumption at 0.05 for NR23. This is due to our notional gearing assumption (30%) remaining unchanged from RP3, given that this is consistent with the long-run gearing of NERL's comparators.
- C112 If we assumed a higher notional gearing assumption as suggested by Oxera then we consider that it could be appropriate to increase our debt beta estimate in line with the CMA's range for PR19.

#### Equity beta

- C113 We propose to re-lever the betas using a notional gearing assumption of 30%. This results in an equity beta range of 0.69 to 0.89.

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<sup>41</sup> See CAP1830a, footnote 56.

## Total market return

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### Context

C114 The TMR reflects the return that an investor expects to receive by investing in the market portfolio (typically assumed to be a market index). It is the sum of the RfR and the equity risk premium. The equity risk premium reflects the additional compensation for bearing the additional risk of owning risky assets such as equities instead of riskless assets.

C115 The TMR is an input into the CAPM, which is used to estimate the cost of equity.

### NERL

C116 Oxera, on behalf of NERL, estimated a TMR range of 5.85% to 6.50% RPI-deflated. This comprised a range based on “market evidence” of 6.00% to 6.50% together with the CMA’s PR19 point estimate for the TMR of 5.85%.

C117 The “market evidence” range was based on the arithmetic average of historical UK equity market returns over non-overlapping 10-year and 20-year holding periods. This nominal return was then deflated using an RPI series created by Oxera that applies the current methodology used for RPI throughout the whole time series. It did not place weight on historical *ex ante* estimates or on forward-looking evidence such as Dividend Discount Models and survey evidence.

### Other stakeholder views

C118 British Airways indicated that it placed weight on CPI-based indices as an input into historical TMR estimates. It stated that it did not expect the CAA to depart from the range proposed by CEPA for H7 of 5.20 to 6.00% RPI-deflated. British Airways notes that this is “broadly consistent” with recent determinations by regulators and the CMA in the aviation, energy and water sectors.

### Our views

C119 We set out our views on the following issues below:

- the appropriate deflator for historical equity returns;
- the use of historical *ex ante* returns to estimate TMR, and
- the assumption of TMR “stability”.

### Deflation of historical market returns

C120 We indicated in our April 2021 Way Forward consultation for H7 that the CMA reviewed an extensive set of evidence in the context of its PR19 determination, including evidence provided by Oxera and other parties. It concluded, based on this assessment, that it was appropriate to place weight on both the CED-CPI series and the CED-RPI series when deflating historical equity market returns.

- C121 We agree with the CMA's view in its PR19 determination that neither inflation series is without its drawbacks and intend to follow the CMA's approach of placing weight on both series. Stakeholders have not subsequently presented additional evidence which persuades us to depart from this approach.
- C122 We note that the CMA applied an adjustment to the historical returns deflated using the CED-RPI series to reflect the impact of the 2010 change in the formula effect. We expect to apply a similar adjustment in NR23.

#### Use of *ex ante* returns

- C123 Oxera has suggested that "we exclude the bottom half of the CMA's range, which largely relied on 'historic *ex ante*' evidence that we consider is unreliable for estimating the forward-looking TMR."<sup>42</sup>
- C124 Oxera has provided no further explanation or justification for this statement, even though this exclusion increases the lower bound of the range for the TMR by 80bps.
- C125 The CMA carefully considered the relevant sources of evidence for the TMR for PR19 and felt it appropriate to include estimates based on historical *ex ante* approaches. We agree with the CMA that these estimates are relevant and should be included. In particular, we consider that there is significant evidence to suggest that historical outturn returns included a substantial "surprise" or "windfall gain" element that could otherwise bias our estimates upwards.
- C126 Moreover, we are not aware of (and Oxera has not presented) any reason why historical *ex ante* estimates should be any less reliable as a basis for estimating the TMR in NR23 than historical *ex post* estimates.
- C127 Therefore, we propose to include the full range estimated by the CMA at PR19: namely, 5.2%-6.5% RPI-deflated.

#### Assumption of a constant TMR

- C128 There has been a longstanding consensus among UK regulators that it is appropriate to assume that the TMR is stable over time, and specifically that the real TMR does not vary with the RfR or inflation.
- C129 In our H7 Final Proposals, we noted two reasons why this assumption may overstate the TMR in future years:
- a historically low real RfR; and
  - RPI inflation that is higher than at any point in the last 20 years.
- C130 We discuss these in turn below.

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<sup>42</sup> Oxera (2021), "Cost of capital for NR23", October, p41.

*Low RfR*

- C131 The RfR has continued its long-term decline since RP3 and, as of our cut-off date<sup>43</sup>, is close to its historical minimum level. If we assume that the TMR is “stable” (that is, invariant to the RfR), this implies a very high equity risk premium relative to earlier price control determinations. It is not obvious, based on the available evidence, why this might be the case: there are no clear indications of increases in investor risk aversion or of enhanced prospects for future long-term UK equity returns in the last 5 to 10 years.
- C132 Although it is generally acknowledged that the total market return is more stable than the equity risk premium, it has not been proven that the total market return is entirely invariant to reductions in the RfR.
- C133 This phenomenon also gives rise to other, “counterintuitive” effects as stakeholders have observed. For example, the high implied equity risk premium means that the cost of equity is highly sensitive to the equity beta. This has led to significant reductions in the cost of equity for lower beta entities such as energy and water companies, while the cost of equity for ANSPs and airports does not appear to have fallen at all – giving rise to an apparent “WACC premium” of ANSPs and airports over network utilities.
- C134 The factors set out in paragraphs C131 to C133 suggest that there might be a *prima facie* case for assuming a modest level of correlation between the TMR and the RfR, with a consequent reduction in the level of the TMR.

*High Inflation*

- C135 We also note that the assumption of a constant real TMR implies significant increases in the nominal TMR during inflationary periods such as NR23. Effectively, we would be assuming that UK equity returns are fully inflation protected and can “pass through” any inflationary cost pressures.
- C136 This assumption may not be valid and there is evidence to suggest that real equity market returns tend to fall during inflationary episodes<sup>44</sup>. All else equal, this might suggest that there is also a *prima facie* case for assuming a modest level of correlation between the real TMR and the level of inflation, with a consequent reduction in the level of the real TMR in NR23.

*Conclusion in respect of constant TMR assumption*

- C137 As we noted in our H7 Final Proposals, the estimation of the TMR is a complex and imprecise exercise that has been the subject of extensive discussion in the

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<sup>43</sup> We are aware that the risk free rate has increased markedly since our cut-off date. We will reflect further on this at our Final Decision.

<sup>44</sup> See, for example, Ammer, J. (1994), “*Inflation, inflation risk and stock returns*”, Board of Governors of the Federal Reserve System: International Finance Discussion Papers, Number 464, April.

context of several consecutive price control determinations and their subsequent appeals. As such, we do not propose to depart from the consensus approach to the TMR in our Initial Proposals for NR23.

- C138 However, in line with our H7 Final Proposals, we consider that the above observations warrant consideration as part of our determination of the point estimate for the WACC overall. We consider that our TMR estimate can be seen as generous in light of the prevailing macroeconomic circumstances, and the resulting skew in our proposed estimates warrant aiming significantly lower in the range than would otherwise be the case.

### Our Initial Proposals

- C139 We propose a RPI-deflated TMR range of **5.20% to 6.50%** RPI-deflated as our range for NR23. We do not propose to make any direct adjustment to the TMR for the low level of the RfR (as of our cut-off date) or the high level of forecast inflation in NR23 – but will instead reflect these factors in our choice of the point estimate for the WACC.

## Cost of Embedded Debt

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### Context

- C140 As explained earlier we estimate the WACC by reference to the costs that would be incurred by NERL under a notional financing structure. Embedded debt is the debt that the notionally financed entity would already have issued at the start of NR23. The cost of embedded debt provides NERL with an allowance for servicing this debt.

### NERL

- C141 Oxera has estimated the cost of embedded debt based on the yield at issuance on NERL's actual bonds, cross-checked against the trading yield on corporate bond indices of similar credit rating and duration.
- C142 It has proposed a nominal cost of debt allowance of 1.72% calculated as the average of the yield at issuance on the following debt instruments, weighted by their principal value:
- Based on £450 million 10-year amortising bond maturing in March 2031;
  - Based on £300 million 12.5-year bullet bond maturity in September 2033; and
  - A £450 million 10-year bullet bond that is assumed to be issued in March 2022 to replace the two-year bridge loan facility outstanding as at the time that Oxera's report was published.
- C143 It has compared the first two instruments to the trading yield on a corporate bond index of corresponding credit rating and tenor:

- The bond maturing in 2031 was compared to the iBoxx £-denominated A-rated 7-10 year index; and
- The bond maturing in 2033 was compared to the iBoxx £-denominated 10+ year index.

- C144 It concluded that both bonds were priced competitively and below the corresponding indices.
- C145 NERL has also estimated that the cost of the bond that it assumes will be issued in 2022 will be 1.97%. This was based on the sum of the estimated yield (based on forward curves) on UK nominal gilts in March 2022 (1.12%) and a NERL-specific premium of 85bps based on the spread of the existing 10-year bond over nominal gilts.
- C146 The weighted average nominal cost embedded debt then deflated by NERL's estimate of RPI inflation during NR23 of 3%, to arrive at an RPI-real cost of embedded debt of -1.24%.<sup>45</sup>

#### Other stakeholder views

- C147 British Airways stated that it has no objection to Oxera's approach as a starting point for the assessment in NR23, noting that it is consistent with the approach adopted by the CMA at RP3. However, it considers that:
- we should be mindful of the incentive properties associated with basing an allowance for the cost of embedded debt closely on NERL's actual costs;
  - we should avoid adopting an approach that would expose customers to higher costs than would be the case under an alternative, notional approach; and
  - we should carefully scrutinise adjustments - for example, in respect of forward rates - where different approaches exist for implementing these.

#### Our views

- C148 We have some concerns with Oxera's analysis in relation to the efficiency of NERL's bonds and how it places weight on each bond.
- C149 With respect to the efficiency of NERL's bonds Oxera appears to have overstated the efficiency of the bonds issued as part of restructuring in April 2021. Oxera benchmarked the bullet bond to the iBoxx A 10+ index when the more appropriate benchmark for this bond would be the iBoxx A 10-15 index, as the maturity for this index on the issue date (12.51 years) was close to the

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<sup>45</sup> This has been derived from Oxera's estimate of -1.11% in Table 4.2 of its report, but excludes issuance and liquidity costs.

maturity of the bullet bond (12.5). We find NERL outperformed this benchmark by 10bp on the issuance date.

- C150 The amortising bond should not be benchmarked against only the iBoxx A 7-10 index as the weighted average life of the amortising bond (6.825 years) is lower than the maturity of the iBoxx A 7-10 index on this day (8.16 years). A relevant comparison would also be the iBoxx A 5-7 index which had a maturity of 5.79 years on the issue date. If we take a weighted average of the iBoxx A 5-7 index and the iBoxx A 7-10 index to match the weighted average life on NERL's amortising bond, then we estimate NERL's amortising bond underperformed the relevant benchmark by 10bp.
- C151 Our second concern with Oxera's analysis is that in estimating the weight to place on each of NERL's three respective bonds, they do not reflect the reducing balance on the amortising bond. The impact of this is small but we estimated NERL's weighted average interest rate would increase by 5bp over NR23.
- C152 When setting the allowance for NR23, we are mindful of the incentive effects associated with directly basing the cost of debt for NERL on its actual cost of debt, as observed by British Airways. As such, our preference is to estimate a notional cost of debt based on trading yields on corporate bond indices, but to base the characteristics of the benchmark (such as credit rating or tenor) closely on the actual company. If we were to observe a significant difference between our benchmark and NERL's actual cost of debt, we would assess the causes of this difference and reconsider whether we had constructed the benchmark appropriately.
- C153 We have not considered the impact of swaps when setting the cost of debt allowance as in our view these instruments are used for hedging purposes and not directly financing expenditure. This is consistent with the CMA's approach for both RP3 and PR19. Additionally, the CMA did not suggest that Ofgem had made an error by not including the impact of swaps when estimating the cost of debt for RIIO-2.

### **Our Initial Proposals**

- C154 In a similar manner to Oxera, we have constructed separate benchmarks for each of NERL's bonds based on corporate bond indices of similar credit rating and duration. We have then aggregated these into a single notional cost of embedded debt using the value of principal outstanding for each bond in each year of NR23.
- C155 We benchmark each instrument as follows:
- for the £450 million 10-year amortising bond maturing in March 2031, we estimate a cost of 1.34% using a weighted average of the yield on the iBoxx £-denominated A-rated 5 to 7 year index and the corresponding 7-10 year index

as at April 2021<sup>46</sup>. The weights assigned are based on the average number of years to maturity for each index at each point in time, and are designed to produce an average duration corresponding to NERL's bond of 6.825 years<sup>47</sup>;

- for the £300 million 12.5-year bullet bond maturity in September 2033, we estimate a cost of 1.88% based on the yield on the iBoxx £-denominated A-rated 10 to 15 year index as at April 2021; and
- consistent with Oxera's approach, we assume that a bond will be issued at some point in 2022 to replace the two-year bridge loan facility. We have estimated the cost of this bond based on the yield on the iBoxx £-denominated A-rated 10 to 15 year index as at 31 March 2022 of 2.88%. However, we note that NERL have not issued this bond yet and we may update this assumption for final proposals.<sup>48</sup>

C156 Weighting these costs by the value of principal outstanding in each year of NR23 implies a nominal cost of embedded debt of 2.24%.

C157 In line with NERL's actual structure, we assume that the notional entity would only have issued fixed-rate debt to date and would not have entered into any index-linked swaps.<sup>49</sup>

C158 As such, we consider that the appropriate deflator for NERL's embedded debt cost is the forecast level of RPI over the NR23 period of 3.16%. This implies an RPI-real cost of embedded debt of -0.89%. We have estimated a higher cost of debt than NERL reflecting recent changes in market conditions and adjusting for the fact that NERL's outstanding bonds amortise over NR23.

## Cost of New Debt

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### Context

C159 New debt is defined as debt that the notional company would issue in the course of NR23 under the notional financial structure. The cost of new debt provides NERL with an allowance for servicing this debt. The impact of the cost of new debt on the WACC depends on the extent of new debt issuance in NR23.

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<sup>46</sup> This date was chosen to roughly correspond to the date of NERL's debt refinancing.

<sup>47</sup> We note that Oxera's analysis slightly overestimates the outperformance of NERL's bond compared with the notional benchmark, since it has used an index with average duration than NERL's bond.

<sup>48</sup> We engaged with NERL to understand how we should reflect this in our initial proposals for NR23. NERL suggested we should use the assumption from their business plan when estimating the cost of debt of NERL and the associated issuance profile.

<sup>49</sup> We have also made no adjustment for fixed-floating swaps, since these appear to be used by NERL for hedging purposes, and do not appear to be integral to its financing costs. Further, Oxera have not made any such adjustments in its assessment. NERL do not appear to have entered into any currency swaps.

C160 Under current our current base case assumptions, we estimate that NERL will not issue any new debt in NR23, so the cost of new debt does not influence our NR23 WACC. Nonetheless we provide a discussion of the cost of new debt below, as the cost of new debt may be relevant to stress testing scenarios in assessing NERL's financeability.

## NERL

C161 NERL has not explicitly modelled any new debt issuance in its NR23 business plan.

C162 However, it notes that "the approach to modelling new debt would be identical to the approach described for modelling the refinancing of the bridge facility, the only difference being that the forward adjustment should be computed on the basis of the expected issuance date during NR23."<sup>50,51</sup>

## Other stakeholder views

C163 We have not received views specifically on the cost of new debt from airline stakeholders.

## Our views

C164 We disagree with the Oxera's view that the cost of new debt should be estimated based on a forward adjustment on the basis of the expected issuance date of any new debt in NR23.

C165 As we have indicated at H7 Initial and Final Proposals, we do not consider that forward rates are good predictors of future spot rates. We also note that the CMA did not apply a forward adjustment in its PR19 determination.

C166 We therefore propose instead to base the cost of new debt on the spot yield on the iBoxx £-denominated A-rated 10 to 15 year index as at the latest available date prior to our cut-off date of 31 March 2022. We intend to update this for our final performance plan decision.

## Our Initial Proposals

C167 Based on the yield on iBoxx 10 to 15 year A index as of 31 March 2022 we propose a nominal cost of new debt of 2.88%. In line with our assumption for embedded debt, we assume that any new debt raised in H7 would be fixed rate debt. The appropriate deflator for the nominal cost of new debt is therefore the forecast level of RPI over the NR23 period of 3.16%. This implies an RPI-real cost of embedded debt of -0.27%.

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<sup>50</sup> Oxera (2021), "Cost of capital for NR23", October, p52.

<sup>51</sup> NERL would hypothetically estimate the cost of new debt as follows: i) The bond will be estimated using the forward curve for RfR as of the issuance date in NR23. ii) A premium of 85bps, which is the difference between the yield at issuance of the bullet bond and UK gilts will be added to this estimate.

- C168 As indicated above, we propose to apply zero weight to this value for the purposes of estimating the allowed return on NERL's RAB for NR23. However, for the purposes of modelling downside scenarios, we assume that any new debt is issued at a cost in line with estimate set out above. We do not assume any change in the allowed return under these scenarios.

## Issuance and liquidity costs

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### Context

- C169 Issuance and liquidity costs – referred to by some stakeholders as transaction costs – represent the additional costs associated with issuing debt that is incurred by issuers and not captured directly within the interest cost of the debt. Issuance costs represent one-off transaction costs associated with issuing debt and include, for example, legal costs and bank fees. Liquidity costs represent the cost of maintaining committed facilities to ensure that funding is available to repay bond principle as it comes due and to fund capex requirements. They are typically a prerequisite of accessing bond finance.

### NERL

- C170 NERL has proposed an allowance for issuance and liquidity costs of 13bps, comprising 8bps for issuance costs and 5bps for liquidity costs. The proposed allowance for issuance costs is based on NERL's actual costs incurred in respect of the current bonds issued under the April 2021 refinancing, and the liquidity cost allowance is based on the value determined by the CMA at RP3.

### Other stakeholder views

- C171 We have not received comments from airlines specifically in relation to NERL's issuance and liquidity costs.

### Our view

- C172 We have reviewed NERL's estimate and are satisfied with NERL's proposed issuance and liquidity cost allowance. NERL's request is broadly in line with the CMA's RP3 allowance and we do not see a good reason for departing from this benchmark.

### Our Initial Proposals

- C173 We propose to set an allowance for issuance and liquidity costs of 13bps, in line with the value set out in NERL's business plan.

## Sensitivity of the WACC estimate to our gearing assumption

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### Context

- C174 At RP3, the CMA noted that the allowed return increased with its notional gearing assumption. This resulted in the CMA using a notional gearing

assumption based on the gearing of the comparators it used to estimate asset and equity beta values. The CMA said that setting a higher notional gearing was not in NERL's customers best interests if a higher gearing resulted in a higher allowed return.

- C175 This is contrary to the Modigliani-Miller theory, which states that the WACC of a business or project is invariant to capital structure if there are no frictions or market imperfections (such as taxes or information asymmetry).
- C176 This apparent contradiction of the M&M theory is the result of the following factors:
- the cost of debt should vary with gearing but regulators often assume an observed number based on one level of gearing and do not adjust it for changes in gearing.
  - the debt beta is difficult to estimate often assumed to be fixed irrespective of gearing with the debt beta impacting asset and equity betas through the de-levering and re-levering process.
- C177 Oxera has analysed the impact of this distortion as part of its WACC report for NERL. We think this is a useful cross-check and have replicated this using our own parameters for NR23.

## NERL

- C178 Oxera, on behalf of NERL, has considered the impact of different gearing assumptions on its WACC estimate.<sup>52</sup> It note that the choice of gearing has little impact on the overall WACC, therefore negating the need to adhere to the Modigliani-Miller theory (that is, set notional gearing equal to comparators' gearing).<sup>53</sup>

**Table C.5: Summary of Oxera's analysis of the impact of gearing assumption on cost of equity and WACC**

	Oxera - Low	Oxera - High
30% to 60% gearing	17bps	0bps
30% to 50% gearing	12bps	0bps

Source: Oxera, "Cost of capital for NR23," 28 October 2021, "Table 5.1: Impact of gearing assumption on cost of equity and WACC," page 53.

## Our Initial Proposals

- C179 The table below sets out how our WACC changes with different gearing assumptions.

<sup>52</sup> Oxera, "Cost of capital for NR23," 28 October 2021, page 50 to 54.

<sup>53</sup> Oxera, "Cost of capital for NR23," 28 October 2021, page 53.

**Table C.6: Changes in WACC with different gearing assumptions**

	CAA - Low	CAA - High
30% to 60% gearing	34bps	43bps
30% to 50% gearing	23bps	29bps

Source: CAA

C180 Our chosen parameters are more sensitive to Oxera's estimates to the choice of gearing. This largely is due to the impact of a lower real cost of debt than Oxera. Our finding is lower than the CMA's determination for RP3 which found its WACC increased by 0.5% as a result of increasing NERL's gearing from 30% to 60%.<sup>54</sup> We are of the view that these results do not warrant any change in our approach to setting NERL's WACC.

## Choice of a point estimate

### Context

C181 There is a degree of uncertainty associated with estimating each of the parameters used to assess NERL's WACC, so we have estimated a range of plausible estimates for each parameter. To determine a single point estimate for the WACC for the NR23 price control, we need to determine the appropriate balance between the risk of setting the WACC too high, leading to consumers paying too much; and setting the WACC too low, and potentially undermining long-term financeability and/or incentives for investment.

### NERL

C182 In its business plan, NERL estimated a point estimate for each WACC parameter, as opposed to estimating a range for each parameter and derived a point estimate for the WACC overall.

C183 Nonetheless, NERL considered various factors that it considered were relevant to the choice of the point estimate:

- **welfare effects and investment** – NERL concluded that that there are no strong grounds for applying an uplift to the allowed return in order to promote investment. However, it noted that a final view on the merits of aiming up may need to be undertaken once the proposed price control package has been defined in greater detail.
- **expected outperformance** – NERL concluded that there was no basis for including an adjustment to reflect expected outperformance in NR23; and

<sup>54</sup> CMA (2019), "NATS En-route Limited (NERL) Price Determination: Appendix D", August, Paragraph 4.

- **parameter asymmetry** – NERL considered that there are two factors that could suggest an asymmetry within the range for individual WACC parameters. Firstly, NERL considered that there is now a stronger body of regulatory precedence in support of a TMR estimate of 5.85%, notwithstanding the empirical evidence which, in NERL’s view, supports an estimate in the range 6.0-6.5%. NERL has therefore selected a TMR estimate at the bottom of its proposed range. Secondly, NERL considered that evidence on comparator equity betas suggests an estimate above the midpoint of the range.

C184 NERL’s overall point estimate for the WACC was close to the midpoint of its proposed range.

### Other stakeholder views

C185 British Airways agreed with NERL and Oxera’s proposed approach to selecting a point estimate, and indicated that it expected the CAA to adopt a similar approach.

C186 However, British Airways disagreed with NERL and Oxera’s characterisation of a suitable point estimate for the asset beta.

### Our view

C187 We agree with NERL that there is no compelling reason to depart from the midpoint of the range for the WACC.

C188 With respect to the specific considerations highlighted by NERL we:

- have noted in the H7 review that welfare effects and investment might warrant a degree of aiming up in the context of HAL and its particular circumstances it faced in the aftermath of the pandemic. We consider that similar considerations could, in principle, apply to NERL in NR23. However, we have found no evidence of underinvestment by NERL in previous price control periods and so are not persuaded there is a case for aiming up in relation to NERL at NR23;
- agree with NERL that any expected outperformance in NR23 would not warrant a departure from the midpoint of the WACC range. Rather, such outperformance should be addressed at source: that is, within the relevant incentive framework;
- agree with NERL that there is downward skew within the TMR range, but for somewhat different reasons. We have previously highlighted that we consider NERL’s proposed range for the TMR omits relevant and important evidence in respect of historical *ex ante* returns. Once this evidence is included within the range, NERL’s point estimate ceases to constitute the lower bound of the range;

- have noted in the H7 review that the assumption of TMR stability in the face of low (by historical standards) interest rates and high inflation could imply that our point estimate of 5.85% (RPI-real) was upwards-biased. We consider that this logic also applies to NR23. At the same time, we note that the OBR's March 2022 forecast of inflation during NR23 is expected to be closer to its long-term average than the H7 forecast. This suggests that the degree of skew resulting from elevated inflation is likely to be more limited in NR23 than in H7; and
- have adopted a different approach to estimating NERL's equity beta compared with NERL's business plan. The evidence and approach we have adopted does not appear to exhibit any particular skew either upwards or downwards. On this basis, we do not consider that our equity beta estimates warrant any departure from the midpoint of the overall WACC range.

### Our Initial Proposals

C189 Overall, in light of the considerations set out above, we do not see a compelling case for departing from the midpoint of our proposed range for the RPI-real, vanilla WACC of 2.04%-3.59% - that is, 2.81%.

### Alternative scenario

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C190 We set out below further detail on the alternative scenario referred to in paragraph 6.108 of the main document.

C191 In this scenario, we have examined the impact on the WACC of changes in interest rate and inflation forecasts up to the end of August 2022.

C192 The relevant assumptions are set out below.

### Risk free rate

C193 We have reflected the evolution of UK index-linked gilt yields up to the end of August 2022.

C194 Spot yields as at the end of August were -0.77%. Given expectations of imminent increases in the Bank of England base rate, we assumed that this would increase by a further 50bps, i.e. to -0.27%.

C195 We did not see a compelling reason to depart from our base case estimate of the convenience yield of 37bps.

C196 We then estimated the risk free rate as the simple average of:

- The assumed yield on index-linked gilts -0.27%; and
- The sum of the index-linked gilt yield and our convenience yield, i.e. 0.10%.

C197 This results in a risk free rate estimate of -0.09% under our alternative scenario.

## Cost of embedded debt

- C198 Our understanding is that NERL is expecting to issue an additional bond in 2022, and we have assumed that the notional entity would do the same. As such, we have reflected the possibility that the notional entity may issue a 2022 bond at higher cost than was previously assumed, and that this would be reflected in a higher cost of embedded debt.
- C199 For our base case assumption, we had assumed that the 2022 bond would be issued at a yield of 2.88%. Under our alternative scenario, we have assumed that this bond would be issued at a yield of 4.90%.
- C200 This results in an all-in nominal cost of embedded debt of 2.92%.
- C201 We continue to assume no new debt issuance in NR23.

## Inflation

- C202 We have developed an updated forecast of RPI inflation over NR23 based on forecasts produced over the summer of 2022 by HSBC and Morgan Stanley respectively. This is set out below:

**Table C.7: Forecast of RPI inflation under our alternative scenario**

	2023	2024	2025	2026	2027	Average
RPI inflation	6.89%	4.48%	3.45%	2.86%	2.86%	4.11%

Source: HSBC Inflation Forecast, Morgan Stanley Inflation Forecast, and OBR inflation forecast.

## Impact on the WACC estimate

- C203 The table below summarises the impact of these alternative assumptions on our base case WACC estimate.
- C204 The cost of equity has increased relative to our base case due to the increase in the risk free rate. Since NERL's beta is assumed to be less than one, this results in a positive correlation between the risk free rate and NERL's cost of equity.
- C205 The cost of debt has fallen slightly relative to our base case. This is largely due to the higher inflation forecast resulting in a lower RPI-real cost of embedded debt. This is offset by the increase in the nominal cost of embedded debt due to the higher assumed cost of NERL's 2022 bond. We will review this assumption at Final Proposals and take account of new evidence that emerges in respect of NERL's debt issuance.
- C206 Since the impact on the cost of debt is relatively small, and because NERL's gearing is relatively low, the impact on the cost of equity dominates and this results in a higher WACC overall.

**Table C.8: WACC estimate under alternative scenario**

	Ref	Base (Low)	Base (High)	Alternative
Gearing	A	30.00%	30.00%	30.00%
Risk Free Rate	B	(2.41%)	(2.78%)	(0.09%)
TMR	C	5.20%	6.50%	5.85%
Asset Beta	D	0.54	0.64	0.59
Debt Beta	E	0.05	0.05	0.05
Equity beta	$F = (D-E*A)/(1-A)$	0.75	0.89	0.82
<b>Cost of equity</b>	<b><math>G = B + F*(C-B)</math></b>	<b>3.30%</b>	<b>5.51%</b>	<b>4.79%</b>
Cost of new debt	H	(0.27%)	(0.27%)	0.76%
Cost of embedded debt	I	(1.02%)	(1.02%)	(1.14%)
Proportion of new debt	J	0.00%	0.00%	0.00%
Issuance and liquidity cost	K	0.13%	0.13%	0.13%
<b>Cost of debt</b>	<b><math>L = H*J + (1-J)*I + K</math></b>	<b>(0.89%)</b>	<b>(0.89%)</b>	<b>(1.01%)</b>
<b>Vanilla WACC</b>	<b><math>M = L*A + G*(1-A)</math></b>	<b>2.04%</b>	<b>3.59%</b>	<b>3.05%</b>

Source: CAA analysis; NERL business plan Appendix M, page 10.

Notes: All figures are presented in RPI-real terms.

## APPENDIX D

# Service quality

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D1 This appendix provides further detail on the calculation of the service quality metrics discussed in chapter 2 of our Initial Proposals.

## Environment

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### 3Di calculation

D2 3Di stands for 3-Dimensional Inefficiency/Insight . It is a metric that calculates the score for the efficiency of a flight based on comparing the actual path flown to an optimal profile. The annual score is a combined score for all flights and indicated overall efficiency in UK airspace. It is a proxy measure for aircraft fuel burn and emissions.

D3 The 3Di score is calculated as a combination of:

- horizontal flight efficiency - defined as the difference between the UK portion of the overall optimal flight distance and the actual flight path flown within UK airspace. Horizontal flight efficiency is measured from the actual entry and exit point into and out of UK FIR, where the optimal flight distance is calculated consistent with Eurocontrol methods (see section on other metrics below).
- vertical flight efficiency - defined as the difference in altitude between the reference (requested) flight level and the actual altitude of the period of level flight, alongside the time spent in level flight. Vertical inefficiency is split into flight phases of climb, cruise and descent.

D4 The 3Di coefficients for each of its four parameters (horizontal, climb, cruise and descent) were developed based on a base model which used a sample of 145,865 flights from 2013. The continued appropriateness of the modelling coefficients is tested on an annual basis based on a representative sample of data from the previous year. If the difference between the mean 3Di score produced by the base model and the annual review test model is greater or equal to 8%, then the test is considered failed and the financial incentives for that year are suspended.

D5 Vertical (in)efficiency is calculated for each individual flight phase as follows:

D6 Vertical Inefficiency = 
$$V = \sum_s \frac{T_s}{T} \left( \frac{L - L_s}{L} \right)$$

- D7 Where: V=Vertical Inefficiency, T=Total Flight Time (UKFIR), S=Step reference<sup>55</sup>, Ts=Duration of Step, L=Reference Level, Ls=Level of Step.
- D8 Vertical and horizontal flight efficiency are combined using the following model form based on a multiple linear regression. This is a proxy estimate for the impact of the flight trajectory on fuel burn<sup>56</sup>:

$$\varphi = \beta_1 H + \beta_2 V_{CL} + \beta_3 V_{CR} + \beta_4 V_D$$

- D9 Where  $\varphi$  = 3D Inefficiency Score,  $\beta_1, \beta_2, \beta_3$  and  $\beta_4$  are constants,  $V_{CL}$  = Vertical Inefficiency of Climb,  $V_{CR}$  = Vertical Inefficiency of Cruise,  $V_D$  = Vertical Inefficiency of Descent, and H = KEA Horizontal Inefficiency

### 3Di adjustment for non-revenue flights

- D10 Consistent with the approach in RP3, an allowance for an adjustment to exclude a proxy impact of non-revenue flights from the total 3Di score is included. This amounts to an adjustment of -0.6. NERL is expected to report both adjusted and non-adjusted scores.

### The 3Di model

- D11 The coefficients of this model (referred to as the base model hereafter) have been estimated using a sample of 145,865 flights from 2013, and tested on a further sample of 72,935 flights. Coefficients for each phase of flight are illustrated in Table D.1.

**Table D.1: 3Di coefficients**

Parameter	Coefficient
Horizontal flight inefficiency ( $\beta_1$ )	1.1876
Climb vertical flight inefficiency( $\beta_2$ )	0.6687
Cruise vertical flight inefficiency( $\beta_3$ )	0.7617
Descent vertical flight inefficiency ( $\beta_4$ )	1.8712

Source: NERL

<sup>55</sup> A step being a period of the flight at constant level, each step having a corresponding duration and level.

<sup>56</sup> This estimated impact is calculated by comparing the fuel burn for the journey based on an optimal trajectory (continuous climb and descent to/from the reference flight level) to the fuel burn for the actual trajectory followed. These fuel burn estimates are generated by the NATS Kerosene Emissions Research Model (KERMIT) model which uses data on aircraft performance from the Eurocontrol BADA 3.11 database.

### 3Di incentive scheme

- D12 The 3Di incentive scheme is established on the basis of the targets discussed in chapter 2. The annual average 3Di score will be used for the calculation of financial incentives
- D13 As set out in chapter 2, given the short timescales to develop new price controls for NR23, the detailed mechanics of the incentive mechanism will remain broadly unchanged from RP3. We reiterate the expectation that NERL will review 3Di more thoroughly during NR23, taking into account feedback from airlines and any guidance provided by us. It is also our expectation that NERL reviews the continued appropriateness of the base model used to establish the 3Di coefficients.

#### Deadband

- D14 The deadband around the target, or par value, represents a tolerance zone at which no bonus or penalty is incurred.
- D15 In its business plan, NERL proposed narrowing of the deadband from  $\pm 5\%$  in RP3 to  $\pm 4\%$  for NR23. This was based on the proposal to also introduce traffic modulation as well as re-openers for one-off events with significant impact on the 3Di score.

#### Maximums

- D16 As in RP3, beyond the deadband, the incentive will follow a smooth sliding scale until  $\pm 25\%$  of the target at which point maximum financial bonus or penalty will be reached.
- D17 Table D.2 illustrates the 3Di target along with the deadband and maximums.

**Table D.2: 3Di target and incentive ranges**

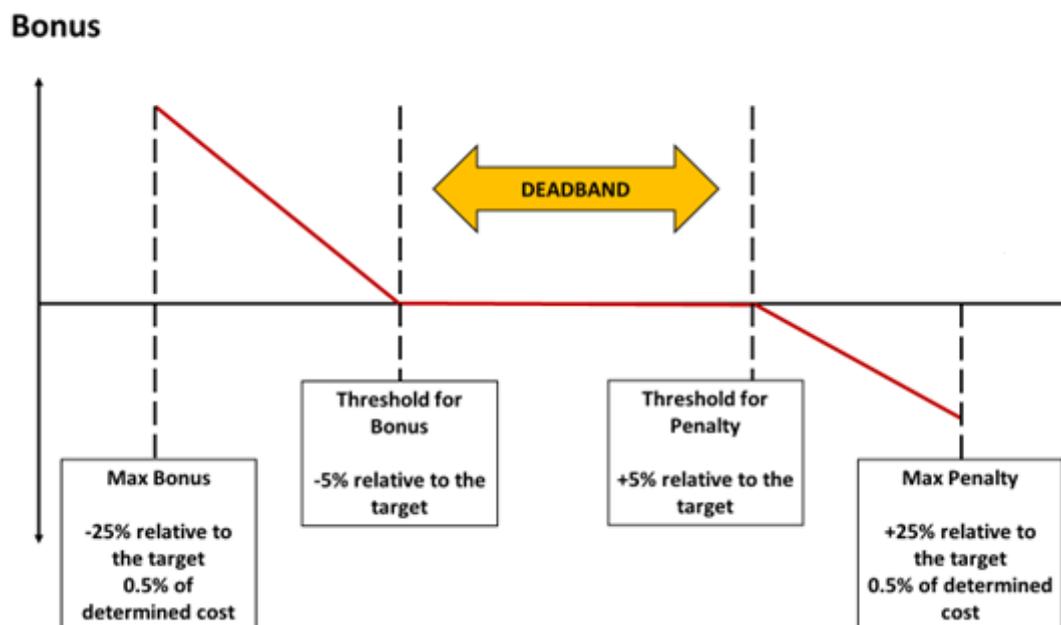
	2023	2024	2025	2026	2027
Maximum penalty	34.49	33.74	33.06	32.39	31.66
Deadband: penalty threshold	28.97	28.34	27.77	27.21	26.60
3Di target	27.59	26.99	26.45	25.91	25.33
Deadband: bonus threshold	26.21	25.64	25.13	24.61	24.06
Maximum bonus	20.69	20.24	19.84	19.43	19.00

Source: CAA

### Incentive rate

- D18 The incentive rate is calculated evenly for each 3Di unit within the range +5% to +25% of the target (and correspondingly between -5% and -25% of the target).
- D19 For example, the incentive rate for 2023 is  $\pm 0.091\%$  of NERL's Determined Costs for each 3Di unit beyond the deadband, up to a maximum of  $\pm 0.5\%$  of Determined Costs. The incentive rate is derived by dividing the overall pot of the incentive scheme (in this case  $\pm 0.5\%$  or 0.005) by the units between the  $\pm 5\%$  deadband and  $\pm 25\%$  maximum threshold. With the 2023 target of 27.59 the range for bonuses starts at 26.21 and ends at 20.69:
- D20  $26.21 - 20.69 = 5.52$ ;  $(0.005 / 5.52) * 100\% = 0.091\%$ .
- D21 Figure D.1 illustrates the incentive scheme for 3Di.
- D22 As discussed in chapter 2 and below, the 3Di thresholds are not modulated for traffic.

Figure D.1: 3Di incentive scheme



Source: CAA

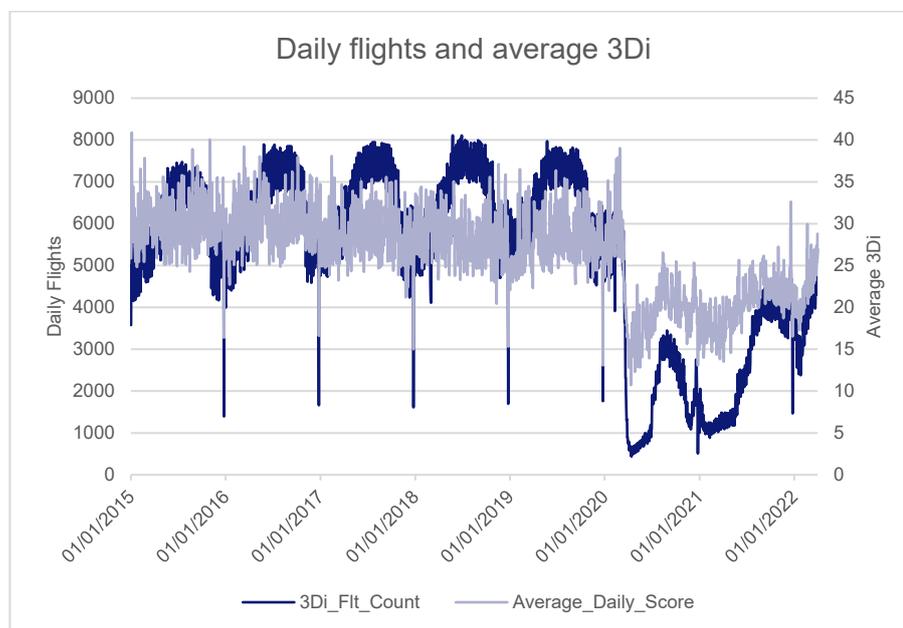
## Traffic modulation

- D23 NERL proposed traffic modulation of the 3Di annual targets in case of variations above 100,000 flights versus forecast. NERL carried out analysis of pre- and post- pandemic traffic and their relationship with 3Di scores. On this basis, NERL consider there to be a strong positive correlation between 3Di and traffic. The statistical relationship it has developed suggests that for every 100,000 change in movements (flights) per year there is a corresponding change in 3Di of 0.5 points.
- D24 NERL's analysis is based on the considerable improvements in 3Di scores during low levels of traffic in 2020 and 2021 and correlates this to the higher (worse) 3Di scores during pre- and post- pandemic traffic. This points to a strong relationship, with an  $R^2$  of 0.8.<sup>57</sup>
- D25 However, prior to the pandemic, in the absence of low traffic volumes that were seen during the pandemic, NERL says that the relationship between traffic volumes and average 3Di has an  $R^2$  of 0.05, which equates to no statistical relationship.
- D26 We requested data from NERL dating back to 2015 and conducted our own analysis. Looking at seasonality over the years with typical traffic volumes up until the start of the pandemic, 3Di remains relatively constant, despite

<sup>57</sup> The "R" refers to a correlation coefficient which represents the level of linear correlation between two sets of data, in this case traffic and 3Di scores.

fluctuating traffic – this is shown in Figure D.2 below. This suggests that 3Di does not increase relative to traffic volumes. In fact, over this period, average 3Di has been on a marginal downward trajectory while flights have trended upwards.

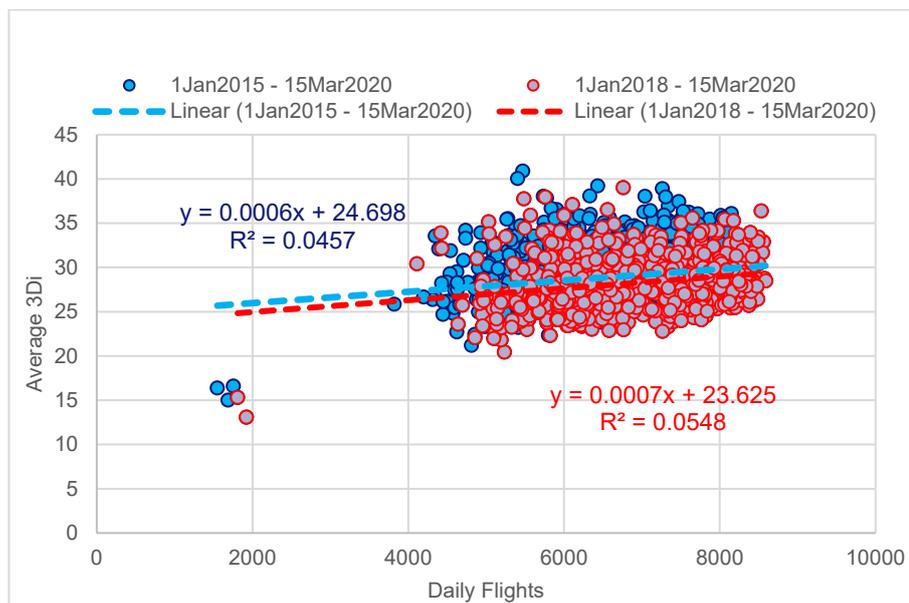
**Figure D.2: Daily flights and 3Di evolution**



Source: CAA analysis of NERL data

- D27 The pandemic has effectively been a one-off event which we do not expect to repeat in NR23. Traffic levels, albeit slightly lower at the start of the period, are set to return to more normal levels during NR23, and traffic variation seen during the pandemic is not representative of our expectations for the future.
- D28 Using data back to 2015, we considered the relationship over a longer period, from 1 January 2015 to 15 March 2020, when the start of the pandemic was felt in the UK. This corroborated NERL's analysis starting 1 January 2018 to 15 March 2020. The slope indicating the relationship was virtually identical between NERL's shorter data set and our extended one with only the level shifted down marginally, which is explained by gradually reducing average 3Di scores over the longer period relative to increasing traffic volumes. See Figure D.3 below.

**Figure D.3: Comparison of longer (2015-start of pandemic) vs shorter (2018-start of pandemic) models**



Source: CAA analysis of NERL data

- D29 We observe some evidence of a slight upward trend in 3Di relative to traffic, although this is characterised by the wide spread of observations around the regression line yielding low  $R^2$  values of circa 0.05. This suggests that only 5% of the variation in 3Di is explained by traffic volumes. The relationship between 3Di and flight volumes is therefore weak, and we think there is no robust argument to modulate the 3Di score on the basis of flight volumes in a normal traffic situation.
- D30 We consider it is much more likely that traffic in NR23 will return to pre-pandemic levels, and that average 3Di will flatten out. While low levels of traffic did reduce average 3Di, this will no longer be the case as traffic normalises. We therefore consider it is not appropriate to modulate 3Di targets for traffic based on observations from the pandemic which was a one-off event.

## Annual review protocol

- D31 We intend that the flight efficiency regression model and output will continue to be reviewed each year. The annual review will test the continued appropriateness of the regression modelling coefficients that underpin the 3Di as described above.
- D32 The annual review will use a sample of the review year data chosen (using cluster sampling) to provide a sample reflective of the underlying population, with a target of 50,000 flights, and apply the same linear regression methodology used to derive new 3Di model coefficients.

- D33 The test model will be applied to the full calendar year data from the review year and the calculated mean 3Di score is compared to the actual mean 3Di score using the base model (3DI) for the year.
- D34 If the difference between the mean 3Di score produced by the base model and the test model is greater than or equal to 8% of the base model score (3DI), then our intention is that the 3Di bonus/penalty for the year would be cancelled. If the difference between the mean scores falls within the pre-specified threshold, then the bonus/penalty is applied.
- D35 The test will be verified by us, and NERL should supply all data used to undertake the analysis (and any other relevant data requested) to us by end of March in each year to allow the verification to be undertaken.
- D36 The data to be supplied to us will comprise:
- dataset to comprise of 50,000 sample flights representative of the population of all flights in the year;
  - details of how the sample has been chosen using cluster sampling, including number of clusters identified, total number of days falling within each cluster, number of days sampled from each cluster and number of flights operated on the days sampled;
  - the test model coefficients;
  - the test model estimate of 3Di for the review year (X) based on the test and base model adjusted by -0.6 to account for exempt non-revenue flights;
  - the existing set of coefficients from the base model;
  - the existing estimate of 3Di for the review year (Y) based on the base model coefficients; and
  - for each flight - values for I, H, VCI, VCr & VD as used in the existing model.
- D37 The result of the annual review will be published by 30 April in the year following the review year to allow financial statements to reflect the outcome.
- D38 If the annual review test falls outside the accepted tolerance in a given year, then the test will be repeated in the following year as per the protocol set out above.
- D39 If the annual review test falls outside the accepted tolerance in two consecutive years, the CAA would expect the incentive to be withdrawn for the remainder of the period. If, however, the CAA and NERL are in agreement that the retention of the incentive is justified then it may remain in place until the following annual

review. This justification would require sufficient analytical work, to be conducted and shared by NERL, to demonstrate:

- an understanding of the underlying causes of the variation in test results, and
- that continuing the model in its existing form would not lead to the generation of unwarranted bonuses/penalties in future years.

## Capacity

### Network Operations Plan

D40 In July 2022 the Eurocontrol Network Manager published a new Network Operations Plan (NOP) covering the period 2022 to 2026<sup>58</sup>. This included a base and high-level delay projection per ANSP based on STATFOR's October 2021 traffic forecast (base and high) and "capacity plans agreed with all ANSPs during the period November 2021 to February 2022". NERL's forecast delay is illustrated in the table below.

**Table D.3: NOP2022-2026 forecast delay**

Seconds/flight	2022	2023	2024	2025	2026	2027
NERL C1 target proposal	n/a	14.70	15.30	15.30	15.30	15.30
NOP forecast for base-case traffic	8.40	8.40	9.00	6.60	6.60	n/a
NOP forecast for high-case traffic	20.40	48.00	32.40	31.80	25.20	n/a

Source: NOP (translated from minutes/flight to seconds/flight)

### C2 NERL-attributable delay

#### C2 incentive scheme

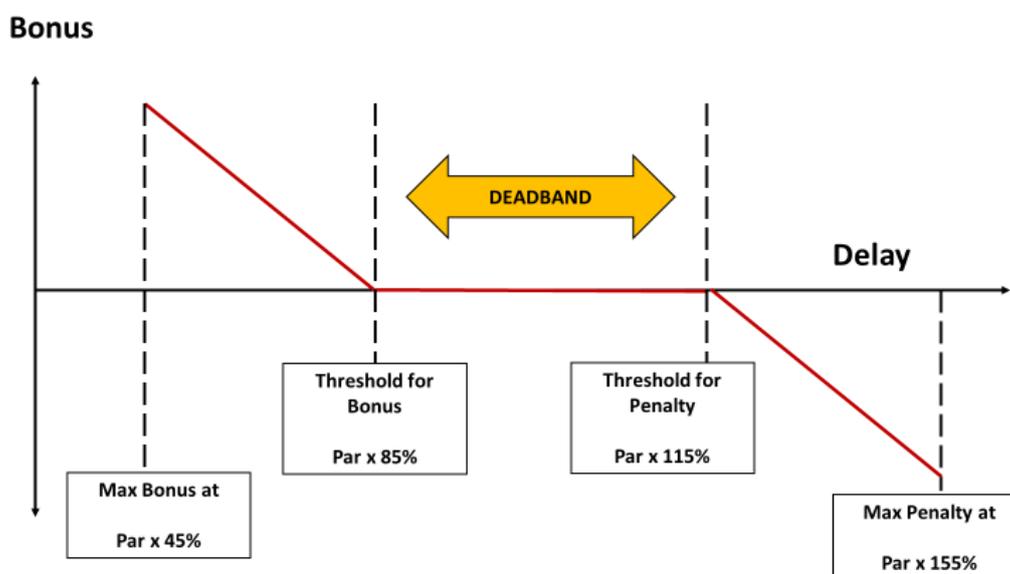
D41 The C2 is a metric based on the C1 targets but adjusted for the purpose of incentivising NERL to manage NERL-attributable ATFM delay. C2 is focused on certain categories of delay that have been deemed to be ANSP-attributable.<sup>59</sup>

D42 These Initial Proposals maintain the current symmetric deadband range of  $\pm 15\%$  applied to the C2 target, so that minor variations in ATFM delay do not lead to bonuses or penalties.

<sup>59</sup> These causes are ATC capacity (C), ATC routings (R), ATC staffing (S), ATC equipment (T), airspace management (M) and Special Event (P), as set out in the Eurocontrol, ATFCM Users Manual

- D43 As in RP3, maximum allowed bonuses or penalties would be reached if NERL's performance is outside the deadbands by an additional  $\pm 40\%$ . The incentive will follow a sliding scale as illustrated in Figure D.4 below.

**Figure D.4: C2 deadband and incentives**



Source: CAA

### Network Manager's post-ops process

- D44 This measure is also subject to the Eurocontrol Network Manager's post-operational process that ensures delays are attributed to the appropriate reason and location
- D45 The Network Manager's post-operational performance adjustment process was originally set up under the EU performance framework to allow ANSPs, or other operational stakeholders, to notify national and European authorities of issues that relate to ATFM delay measurement, classification and assignment. As members of Eurocontrol, we continue to be a part of the process. More information is available from: <https://www.eurocontrol.int/publication/post-operations-performance-adjustment-process>

## C3 – Impact Score

### Calculation of C3

- D46 The C3 metric is an impact score, which places greater weight on long delays and delays in the morning and the evening peaks. The targeted levels of the C3 impact score are set out in chapter 2. The annual impact score is calculated by weighting ATFM delays in accordance with Table D.4 below.

**Table D.4: Weights for impact score**

	Morning peak period	Evening peak period	Other times
Delay > 0 and <= 15 minutes	3	2	1
Delay > 15 and <= 30 minutes	6	3	2
Delay > 30 and <= 60 minutes	9	6	3
Delay > 60 minutes	18	9	6

Source: CAA

Notes: "Morning peak" means flights with an off-block estimated time between 0400 and 0800 UTC in Summer (April – October inclusive) and between 0500 and 0900 UTC in Winter (January – March inclusive and November-December inclusive). "Evening Peak" means flights with an off-block estimated time between 1500 and 1900 UTC in Summer (April –October inclusive) and between 1600 and 2000 UTC in Winter (January-March inclusive and November-December inclusive).

D47 The weights in Table D.3 were developed through consultation between stakeholders in a previous control period and will continue to apply in NR23.

### **C3 incentive scheme: changes for NR23**

D48 As introduced in chapter 2, from NR23 and for consistency with remaining incentive schemes, we propose that the C3 metric is described as a single target with deadbands, where no bonus and penalty are incurred, and maximums at which the full bonus of penalty is incurred. The deadbands are equivalent to the RP3 upper penalty threshold and lower bonus threshold with the target being the mid-point between the two.

D49 Historically, the C3 penalty threshold was calculated on the basis of the C2 target, by converting the C2 target expressed in seconds per flight and multiplying it by a factor of 2. The bonus threshold was then calculated as two-thirds of the penalty threshold. In its business plan, NERL appears to have used the ratio of 2.4 for the C3 penalty threshold. No justification was provided for this proposed change in calculation method.

D50 Consistent with RP3 and based on historical relationship between C2 and C3, we propose to calculate the penalty threshold (penalty deadband) by multiplying the C2 target by a factor of 2. We do not propose to revise this ratio for NR23 based on RP3 performance given that the period was unduly affected by the impact of the covid-19 pandemic. As appropriate we may review this ratio ahead of NR28.

D51 As per RP3, the bonus threshold is then calculated as 2/3 of the penalty threshold. The mid-point between the two thresholds will represent the C3 target. The implied deadbands are  $\pm 20\%$ .

D52 For example, for 2023, the C2 target is 8.45 seconds/flight.  $8.45 \times 2 = 16.90$  seconds/flight. This is the penalty threshold for C3. The bonus threshold is

calculated as follows:  $2/3 \times 16.90 = 11.27$  seconds/flight. The target is the mid-point, or average between 16.90 and  $11.27 = 14.09$  seconds/flight.

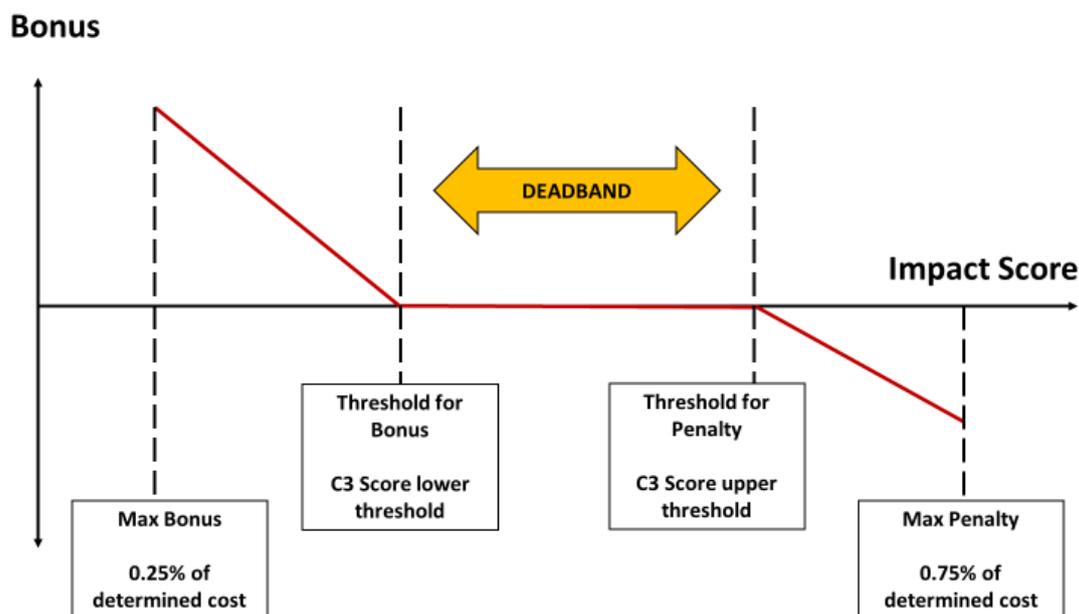
- D53 As discussed in chapter 2, we do not propose to review the traffic modulation mechanism that applies to C3 and these Initial Proposals maintain the method of calculating the incentive rates. The rate at which NERL's performance would affect any bonus it earns has been set such that the maximum reward of 0.25% of Determined Costs would be earned if the impact score is zero and the traffic is as forecast for 2023.<sup>60</sup> That rate is £0.056 in 2020 prices. The penalty rate is £0.111 in 2020 prices up to a cap of -0.75% of Determined Costs. The bonus and penalty rate will be indexed to CPI during NR23.
- D54 The rates are calculated based on total pot for the incentive. For example, for 2023, with a Determined Cost of £623.573m (2020 CPI prices) the maximum bonus and penalty are:
- $0.0025 \times 623.573 = \text{£}1.534\text{m}$  maximum bonus; and
  - $0.0075 \times 623.573 = \text{£}4.602\text{m}$  maximum penalty.
- D55 Based on the traffic forecast for that year (for 2023 this is 2.444), the rates are:
- $1.534 / (11.27 \times 2.444) = 0.056$  for the bonus rate; and
  - $4.602 / (16.90 \times 2.444) = 0.111$  for the penalty rate.
- D56 Figure D.5 illustrates the application of the incentive.

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<sup>60</sup> Available from: [European Network Operations Plan 2022-2026 | EUROCONTROL](#)

The rate is fixed in real terms for every year of NR23 but is calibrated based on 2023 traffic.

Figure D.5: C3 incentive scheme



Source: CAA

### Modulation of C3

D57 The same approach to modulating C3 for traffic volumes that was used in RP3 will be maintained for NR23. If traffic is more than  $\pm 4\%$  different from the level forecast for that year, the bonus/penalty thresholds will be adjusted. The thresholds will be modulated by the net change in traffic beyond the  $\pm 4\%$  threshold, multiplied by an “elasticity factor” of 5.

D58 For example, if the traffic growth in a particular year is 7% higher than forecast, the thresholds will be adjusted upwards by  $(7\% - 4\% = 3\%) * 5 = 15\%$ . For example, should this be the case in 2023, the lower threshold would increase from 11.27 to 12.96 ( $11.27 * 1.15 = 12.96$ ) and the upper threshold would increase from 16.90 to 19.44 ( $16.90 * 1.15 = 19.44$ ).

## C4 – Daily Excess Delay Score

### Calculation of C4

D59 The C4 metric (Daily Excess Delay Score) is based on weighted delays exceeding pre-determined thresholds on a daily basis. The targeted levels of C4 are discussed in chapter 2.

D60 C4 is calculated by weighting ATFM delay in accordance with Table D.5. Delay below the lower threshold is weighted as zero.

**Table D.5: Weighting of delay to derive excess delay score – weightings**

Season	Daily delay thresholds (average delay per flight)		Weighting
Winter	Lower threshold	40 seconds	1
	Upper threshold	80 seconds	2
Summer	Lower threshold	60 seconds	1
	Upper threshold	110 seconds	2

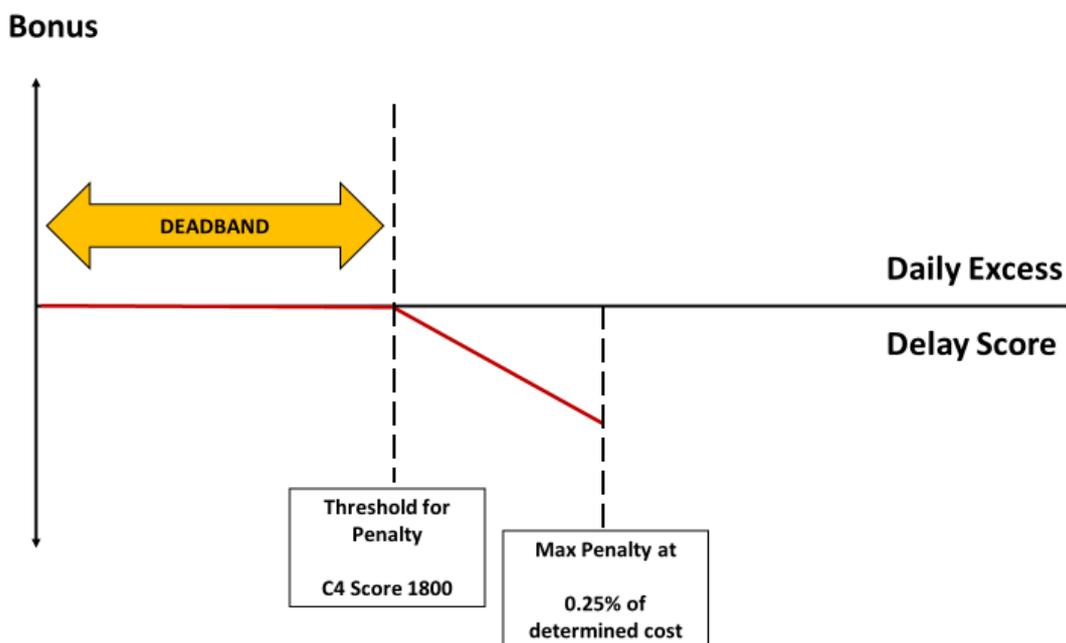
Source: CAA. Note: Summer is April –October inclusive. Winter is January – March inclusive and November-December inclusive.

### C4 incentive scheme

- D61 C4 is a penalty-only incentive scheme. As set out in chapter 2, we propose to maintain the strength of this incentive capped at 0.25% of Determined Costs. The maximum penalty would be incurred if traffic is as forecast for 2023 and NERL's C4 score is 20% higher than the threshold. That rate is -£0.00174342 in 2020 prices.
- D62 The rate is calculated based on total pot for the penalty (for 2023, based on a Determined Cost of £613.573m in 2020 prices, this is £1.534m given the 0.25% maximum cap) divided by: the C4 score at which maximum penalty will be incurred (for 2023, based on the 20% mentioned above this is  $1800 \times 20\% = 360$ ) multiplied by the traffic forecast for that year (for 2023, this is 2.444). The rate for 2023 is calculated as follows:  $1.534 / (360 \times 2.444) = 0.00174342$ .<sup>61</sup>
- D63 The penalty rate will be indexed to CPI during NR23. Figure D.6 illustrates the C4 incentives.
- D64 As in RP3, the C4 threshold is not modulated for traffic volume.

<sup>61</sup> Note the numbers may not add up fully due to rounding of the penalty pot to illustrate the example

Figure D.6: C4 incentive scheme



Source: CAA

## Exemption days

D65 Principles for the application and use of exemption days are consistent with those set out for RP3 and are as follows:

- the mechanism allows NERL to exclude up to 100 days from counting against the C3 and C4 incentives when major new systems or airspace changes are being implemented and transitions are made;
- the exemption days apply only to the C3 and C4 measures;
- on days when C4 is triggered, the implied penalty applied for that day for C3 and C4 in aggregate will be the higher of either individual penalties for the day;
- the amount of days NERL will be allowed to use towards its transitions is capped at 100 days for the entire five-year period of NR23;
- NERL will consult airspace users on the exemption days in advance under currently existing consultation mechanisms (eg. SIP) or targeted consultation;
- the length of any given transition should be limited to three weeks (unless otherwise agreed with users) and will be agreed in advance as well as the amount of days from the overall cap that NERL wishes to use towards this transition;
- the number of days agreed during the consultation will be fixed (unless subsequently revised with the agreement of users) but the particular exempt

days within the agreed transition period would not need to be specified as part of the consultation;

- NERL will carry out the transition by means of the detailed steps and timing that are most operationally practical and *ex post* nominate the exempt days (up to the pre-agreed maximum) for the transitional period (length of which is also pre-agreed); and
- if at the end of the transition period NERL does not need/wish to use the pre-agreed amount of exempt days, these will still count against the overall 100 day cap (i.e. they cannot roll over of unused exclusions).

D66 In addition to the above, we propose that NERL includes a section in its quarterly performance reports on the proposed and actually used exemption days.

## Summary of service quality targets and incentives

D67 Summary of our Initial Proposals for all service quality metrics is provided below.

**Table D.6: Summary of our Initial Proposals for service quality**

		2023	2024	2025	2026	2027
3Di	score	27.59	26.99	26.45	25.91	25.33
C1	seconds/flight	12.29	12.79	12.79	12.79	12.79
C2	seconds/flight	8.45	8.95	8.95	8.95	8.95
C3	seconds/flight	14.08	14.91	14.91	14.91	14.91
C4	score	1800	1800	1800	1800	1800

Source: CAA

D68 A summary of the strength of incentives in NR23 is provided in the table below. As discussed in chapter 2, we propose to maintain the strength of the incentives consistent with RP3.

D69 Mindful of customer priorities and industry goals towards net zero and noting the expected review of the 3Di metric in NR23 as well as the benefits delivered through the capex programme, we expect to strengthen the incentives in future control periods.

**Table D.7: Initial Proposals for the maximum strength of incentives in NR23**

	Bonus (% of Determined Costs)	Penalty (% of Determined Costs)
C1*	0%	0%
C2	0.05%	0.25%
C3	0.25%	0.75%
C4	0%	0.25%
3Di	0.50%	0.50%
<b>Total</b>	<b>0.80%</b>	<b>1.75%</b>

Source: CAA

Note: \* 0% of Determined Costs, but a trigger for C2 and C3 bonus

## APPENDIX E

# Reconciliation

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## Introduction

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- E1 This appendix explains how we intend to treat certain costs incurred by NERL as part of its financial restructuring in 2021.
- E2 As part of this restructuring, NERL redeemed its single existing bond (which was due to mature in 2026) and collapsed its Whole Business Securitisation (WBS). The bond was replaced with various debt instruments, which NERL summarised in paragraph 150 of its response to our November 2021 request for information.<sup>62</sup>
- E3 Since the costs associated with the restructuring were incurred during the reconciliation period as a direct consequence of the covid-19 pandemic and were not included in the allowed revenues set out in the RP3 determination, we consider it appropriate to deal with these costs as part of our reconciliation review.
- E4 In this appendix, we consider:
- whether to include an allowance for these costs within the reconciliation; and if so,
  - the appropriate amount to include within the revised determined costs.
- E5 In addressing these questions, we take account of the allowances already included in the RP3 determination, the circumstances of the restructuring and our approach to estimating the cost of debt within the allowed return for NR23.

## Context and NERL views

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- E6 In our November 2021 working paper on the reconciliation review for NR23, we set out a request for information, including in respect of certain costs associated with its April 2021 restructuring.
- E7 NERL provided this information in its February 2022 response to our request for information. This was summarised in Table 27 of its response, which we have reproduced in chapter 3.

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<sup>62</sup> CAP2291.

- E8 The actual costs NERL incurred in respect of its 2026 bond between 2020 and 2022 comprise:
- the spens payment it incurred as a precondition for redeeming the bond, which is calculated as all scheduled interest and principal payments from the point of redemption, discounted at a predetermined rate equivalent to the prevailing gilt rate at the time of redemption; and
  - the actual interest costs incurred between the start of 2020 and the redemption of the bond.
- E9 NERL has acknowledged that it has already received some compensation for its RP3 debt costs through the RP3 allowed return. As such, it has deducted the proportion of the RP3 allowed return that it considers pertains to the 2026 bond between 2020 and 2022 from its spens and interest costs in this period. NERL estimates that this allowance comprises 60% of the total scheduled interest payments on the bond between 2020-2024.
- E10 NERL has also deducted certain additional amounts from its total requested allowance:
- £6 million pertaining to interest costs assumed to be capitalised in the RAB under the TRS debtor financing cost adjustment; and
  - £1 million pertaining to other debt interest savings over 2020-2022, relative to CMA determination modelling assumptions.
- E11 Our understanding is that the other debt interest savings principally relate to bank facilities that NERL has been able to obtain at slightly lower cost than was assumed by the CMA at RP3.
- E12 The remaining net financing costs of £21.9 million comprise the “shortfall” that NERL is proposing to recover in NR23.

## Our views

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- E13 We have assessed NERL’s refinancing costs on the same basis as the broader reconciliation and to make adjustments based on NERL’s actual costs unless these can be demonstrated to be higher than necessary even without the benefit of hindsight.
- E14 This approach is different to the calculations we normally make in setting a price control (which do not generally involve making specific adjustments for particular refinancing costs incurred after a price control has been set). It reflects the special circumstances of our work to support the identification of the efficient level of costs that should inform the recovery of TRS revenues for the period 2020 to 2022).

- E15 Our assessment of NERL's refinancing costs also reflects the fact that the RP3 determination did not fully account for the impact of the pandemic, which was in its early stages at the time of publication.
- E16 In general, stakeholders should not expect that we would provide compensation for such costs in the future, unless there were exceptional circumstances that warranted such compensation.
- E17 We have considered whether there were viable alternatives to NERL's chosen approach of redeeming its previous bond (maturing in 2026) early and incurring the resulting spens payments. Specifically, we examined whether NERL could have issued additional debt within the WBS structure in place prior to the restructuring. To guide this assessment, we examined comparable WBS issuers in the UK. We found that many such issuers encountered financial challenges during the pandemic, but were nonetheless able to issue debt by obtaining waivers and consents from existing bondholders. HAL is a case in point.
- E18 This suggests it was not strictly necessary for NERL to have redeemed its 2026 bond early and incurred the resulting spens costs. At the same time, we acknowledge that issuing additional debt within the WBS structure would not have been costless:
- retaining the 2026 bond to maturity would have implied a higher ongoing interest cost compared with NERL's refinancing, since the coupon rate on this bond was higher than the instruments NERL issued in its place;
  - in order to avoid default on the WBS during the pandemic and raise further liquidity, it is likely that NERL would have needed to obtain a number of waivers from bondholders. Where other WBS issuers have obtained such waivers, these have implied additional costs.
- E19 We have modelled the additional interest costs that would have been incurred under a scenario where NERL chose to issue additional debt within the WBS structure instead of redeeming the 2026 bond early. Based on this analysis, we estimate that interest costs would have been £9.6 million higher than if it had redeemed the 2026 bond<sup>63</sup>.
- E20 We have also asked our advisors, Centrus, to estimate the additional costs in terms of necessary waivers and consents that NERL would have incurred. Centrus considered the following costs:
- Centrus note that NERL would have needed to obtain a guarantee on any new incremental bond issuance as a precondition of issuing additional debt. They estimate that a reasonable fee for such a guarantee could have been around

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<sup>63</sup> We will make our incremental interest cost analysis available to stakeholders upon request.

15bps, based on their experience of similar transactions. When applied to an estimated incremental bond principal of around £460 million, this implies a fee of around £4.0 million; and

- Centrus estimates that consents for existing banks, bondholders and Assured Guaranty could have cost around £6.4 million, based on precedent transactions.

E21 Together, these costs amount to £10.4 million. The combined interest and waiver costs therefore amount to a total incremental cost of £20.0 million. We further note that NERL has deducted the following amounts from its proposed allowance:

- £6.0 million, pertaining to debt interest costs assumed to be capitalised in the RAB as part of a TRS debtor financing cost adjustment; and
- £1.0 million, pertaining to debt interest savings over 2020-2022 relative to CMA determination modelling assumptions.

E22 We agree with NERL that these values should be deducted from the incremental financing costs. Doing so results in a net incremental financing cost of £13.0 million.

## Initial Proposals

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E23 In light of our assessment, we propose to provide NERL with an allowance of £13.0 million<sup>64</sup> in respect of net incremental financing costs. This corresponds to the estimated costs under a scenario where NERL retained the WBS and issued additional debt within this structure by obtaining the required waivers and consents. We consider that this estimate represents an efficient benchmark based on the standard of evidence we have applied for the broader reconciliation review, namely without the benefit of hindsight.

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<sup>64</sup> In chapter 3 we use a slightly different value (£16m) for the estimate of efficient restructuring costs. Subject to the consultation on our Initial Proposals, we expect to reconcile this inconsistency and utilise this value in our final decision.

## APPENDIX F

# Affordability

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## Introduction

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- F1 In CAP1994 (December 2020) and CAP2119 (March 2021), we said that we would develop an approach to the new price control which protects the affordability of charges while supporting NERL's financeability and ensuring that the longer-term interests of consumers are properly addressed. This would include providing appropriate incentives for efficiency, to aid affordability, while also protecting the quality of service.
- F2 We explained that we do not intend to adopt a simple definition of affordability such as 'no real increase in charges' but that we consider that affordable charges are those which are set at a level that broadly supports users in re-establishing and operating services, given the difficult circumstances created by covid-19. We committed to carrying out further work to establish what affordable charges should mean in practice and said that we would consider whether it would be appropriate for us to take further steps to protect affordability including by adjusting the level and timing of revenue recovery.
- F3 In response to these consultations, several stakeholders provided their views on affordability. While users broadly supported affordability as a policy driver they had different views as to the definition of affordability; some stakeholders considered that affordable charges mean no real increase in charges while others considered charges would need to decrease to remain affordable. Users recognised the importance of efficiency in achieving affordable charges and their role in helping to identify efficiency savings. Despite the focus on affordability, they also recognised the importance of ensuring that NERL is able to deliver an efficient long-term investment programme and support airspace modernisation.
- F4 NERL cautioned that, as well as affordability, the CAA should take account of its statutory duties in relation to NERL's financeability and recognise the longer-term advantages of NERL being able to invest in a resilient service. It also noted that both the short-term and longer-term impacts of any decision on affordability should be duly considered.
- F5 Since publishing CAP2119 in March 2021, we have carried out work to consider how affordability relates to our statutory duties. We have also carried out analysis to support our assessment of the affordability of our Initial Proposals. As part of this analysis, we have identified suitable metrics and analysed data from a range of sources including the Eurocontrol database. This annex presents

a summary of the findings of our analysis together with our current conclusions as to the affordability of charges in our Initial Proposals. It includes the identification of measures we are proposing to put in place to balance affordability and financeability during the NR23 period.

- F6 This appendix has the following 5 sections:
- the link between affordability and our statutory duties.
  - NR23 charges in NERL's business plan.
  - approach to affordability analysis.
  - assessing the affordability of our Initial Proposals.
  - current conclusions for the Initial Proposals

## **The link between affordability and our statutory duties**

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- F7 The CAA's duties are set out in appendix A and chapter 1, but the provisions to highlight for the purposes of this appendix, can be summarised as follows:
- the CAA's primary duty under the TA00 is to exercise its Chapter I functions so as to maintain a high standard of safety in the provision of air traffic services;
  - while the primary duty takes priority, the CAA must also exercise its Chapter I functions in the manner it thinks best calculated to apply the secondary duties; and
  - if, in a particular case, there is a conflict in the application of the secondary duties, in relation to that case, the CAA must apply them in the manner it thinks is reasonable having regard to them as a whole.
- F8 Our duties do not directly refer to the concept of affordability. However, the reference to "costs" in the CAA's secondary duties, coupled with the weighing of competing or conflicting interests that the CAA must undertake, means that consideration of affordability is appropriate in discharging our duties under the TA00. In this context, we have sought to ensure that NERL's future charges will be "affordable" in the sense of representing appropriate value for money. We do so by basing our projections on efficient costs and creating incentives on NERL both to provide an appropriate quality of service and to seek out further efficiencies in the future.
- F9 As noted above, in the case of a conflict between our secondary duties, the CAA must apply the duties to that case in the manner it thinks is reasonable having regard to them as a whole. This could include considering how to balance, for

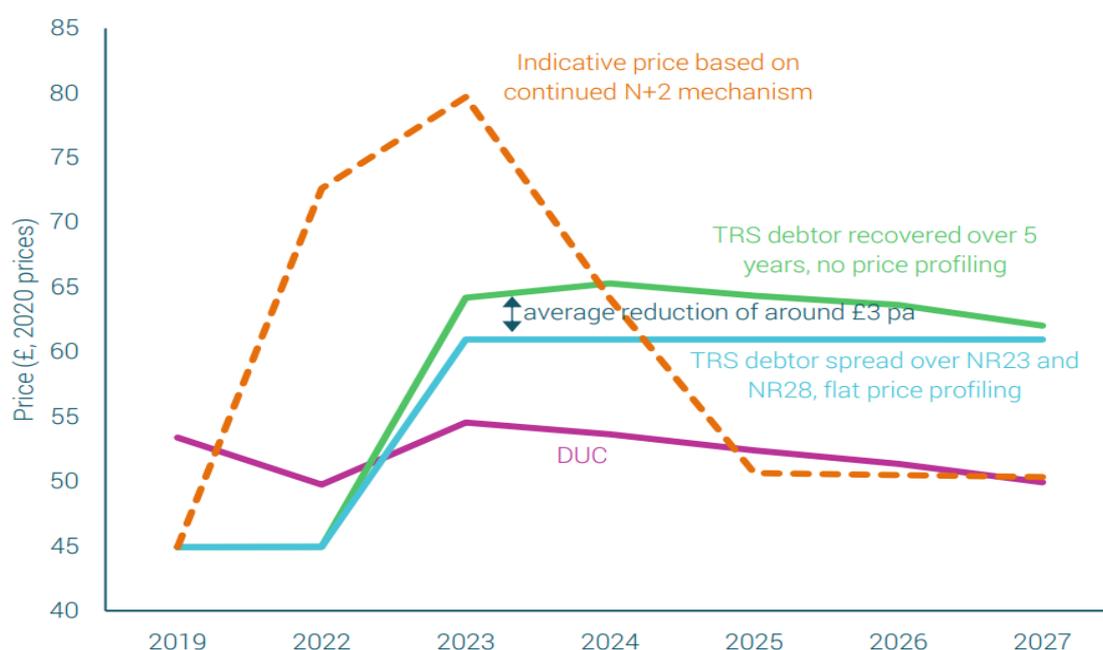
example, the interests of consumers, airlines, airports and persons with rights in property, or the interests we are permitted to consider<sup>65</sup> or the secondary duties.

- F10 For example, we have a secondary duty to exercise our Chapter I functions in the manner we think best calculated 'to secure that licence holders will not find it unduly difficult to finance activities authorised by their licences'. In a case where the application of this duty conflicts with the application of the secondary duties which appear relevant to affordability, the CAA must apply the duties to that case in the manner we think is reasonable having regard to them as a whole.

## NR23 charges in NERL's business plan

- F11 In its business plan, NERL proposed a significant (~35%) increase in its charges between 2019 and 2023 (2023-2027 profiled flat price), from £45 to £61 per service unit. While overall Determined Unit Costs are roughly constant; the proposed unit charge increase is in large part due to recovery of around £577 million of TRS debtor over NR23. NERL proposed to spread the TRS debtor recovery over NR23 and NR28 on a 75%-25% basis, with 75% of the costs spread evenly over the 5-year NR23 period (illustrated in the Figure F.1 below) and the remaining 25% spread evenly over the 5-year NR28 period.

**Figure F.1: NERL's Business Plan charges proposal**



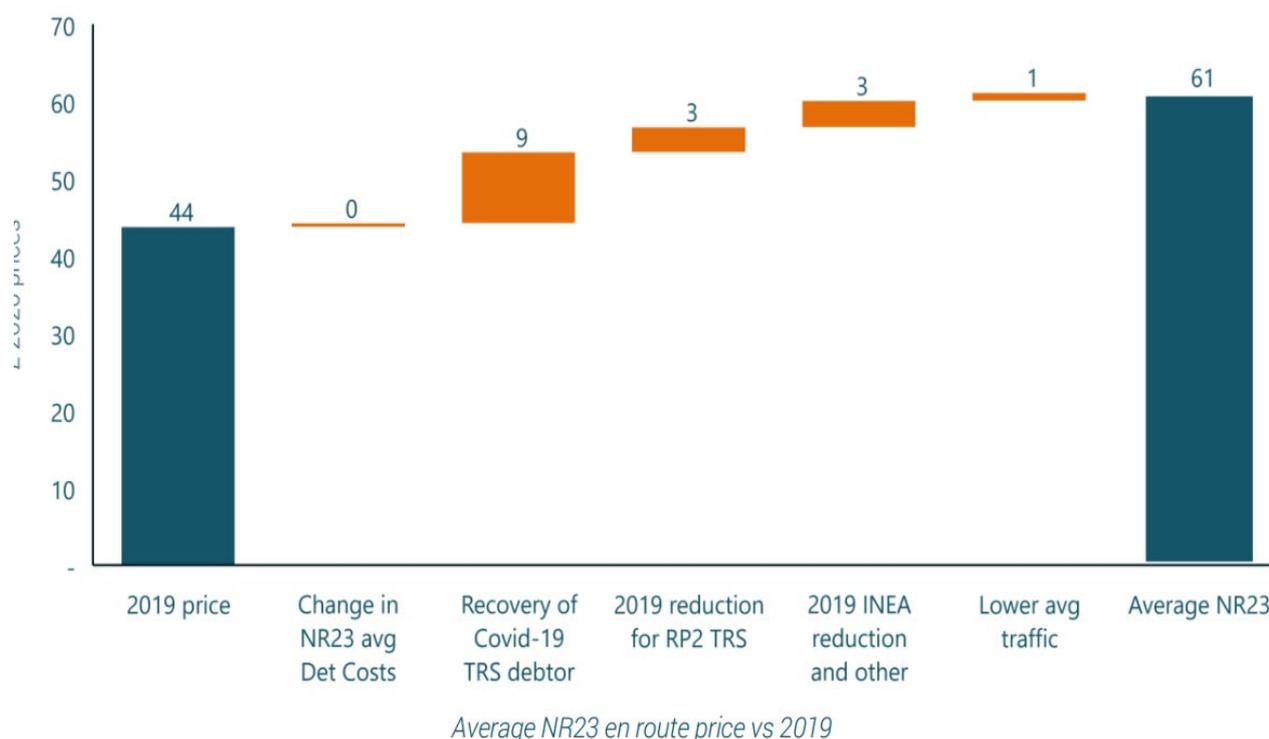
*En route unit rate showing impact of spreading TRS debtor recovery and profiling prices*

Source: NERL business plan

<sup>65</sup> Sub-section 2(3) TA00 provides that the only interests to be considered are interests regarding the range, availability, continuity, cost and quality of air traffic services.

F12 Although the recovery of the TRS debtor does account for most of the headline price increase, there are other factors (mainly European Innovation and Networks Executive Agency funding and pass back of RP2 traffic risk sharing revenues) that contributed to the 2019 price being lower than it would otherwise have been as shown in Figure F.2 below. The recovery of the covid-19 TRS debtor comprised approximately 18% of NR23 Determined Costs in NERL's business plan.<sup>66</sup>

**Figure F.2: Breakdown of charges increases in NERL business plan**



Source: NERL business plan

## Approach to affordability analysis

F13 To assess value for money, economy and efficiency, and hence affordability, of our Initial Proposals, we have set out to consider the following:

- how NERL's charges compare with its own historical charges and those charges of comparator ANSPs<sup>67</sup>;
- the service levels and performance that is being provided by NERL in return for its charges compared with that provided by comparator ANSPs;

<sup>66</sup> £577m/£3,238m in Page 9 of Appendix I of the NERL business plan

<sup>67</sup> As part of this we have also considered the relevance and impact of adjusting international comparisons for purchasing power parity.

- the materiality of NERL's charges and the likely significance of NERL's charges to passengers and airlines; and
- how other European ANSPs are planning to recover their covid-19 related TRS debtor costs.

- F14 We consider that the most relevant metric for charges is the en route unit rate for which there are already well-established service unit metrics (TSU and CSU) as administered through the Eurocontrol Central Route Charges Office (CRCO). We have also considered metrics which include cost per composite flight hour and a measure of cost effectiveness.
- F15 Comparative en route unit rates and cost reporting information from other Eurocontrol Member State ANSPs is accessible through the ETNA portal and the Eurocontrol dashboard<sup>68</sup> has a comparator section<sup>69</sup>. In our affordability analysis we have used NERL's usual comparators in Eurocontrol's ACE Benchmarking reports, namely DFS (Germany), Enaire (Spain), ENAV (Italy) and DSNB (France). These comparators are based on ANSPs with similar traffic volumes and airspace complexity, and who operate in a similar economic environment.
- F16 Additional data sources for NERL, which we have referred to, include ACE benchmarking reports<sup>70</sup>, which provide information on performance indicators relating to the benchmarking of cost-effectiveness and productivity performance.
- F17 While we have based our analysis on European comparators alone, we recognise that the consideration of ANSPs from a wider geographic area may be helpful in assessing the affordability of NERL's charges. For example, as described in paragraphs 5.79 - 5.80 of CAP 1870<sup>71</sup>, it would seem that comparators drawn from the US have, in the past, performed better than European ANSPs on a cost efficiency basis. Furthermore, the UK may be more similar to the US than European ANSPs in terms of scale and controlled area.
- F18 Therefore, we recognise that the choice of comparators may affect the findings of our analysis and the conclusions which we reach. If international evidence indicates that ANSPs can be significantly more cost efficient than those we observe in Europe, it is possible that NERL will perform reasonably well in comparison to the other large European ANSPs, but if those ANSPs themselves are not particularly efficient then the comparison is of limited value.
- F19 The output of the analysis is described in the following sections.

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<sup>68</sup> <https://www.eurocontrol.int/ACE/ACE-Home.html>

<sup>69</sup> See [here](#) and [here](#)

<sup>70</sup> Reports up to 2020 can be found at <https://ansperformance.eu/publications/prc/ace/>.

<sup>71</sup> [CAA response to Statement of Case \(publishing.service.gov.uk\)](#)

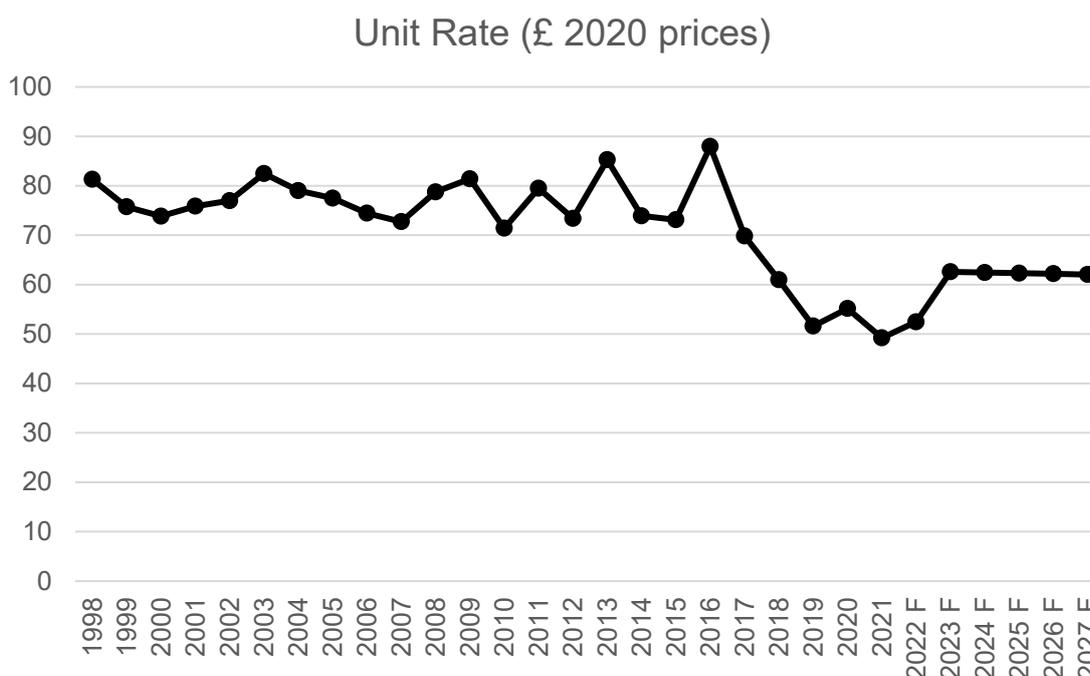
## Assessing the affordability of our Initial Proposals

### How NERL's charges compare with its own historical charges and those of comparator ANSPs

F20 We considered the UK en route unit rate over time and compared it with that of four comparator countries: Germany, Spain, Italy and France. As noted above, we used the Eurocontrol database to source this unit rate information.<sup>72</sup>

F21 The UK's en route unit rates hovered mostly between £70 to £80 (2020 prices) between 1998 and 2016/2017, and falling significantly since then as shown in Figure F.3 below. The charges being considered for NR23 (NERL unit rate being approximately £54 (2020 prices)) mean that UK unit rates (which also include non-NERL components of approximately £8) will not go above that historical range during NR23.

**Figure F.3: UK en route unit rate time series – NR23 IPs**



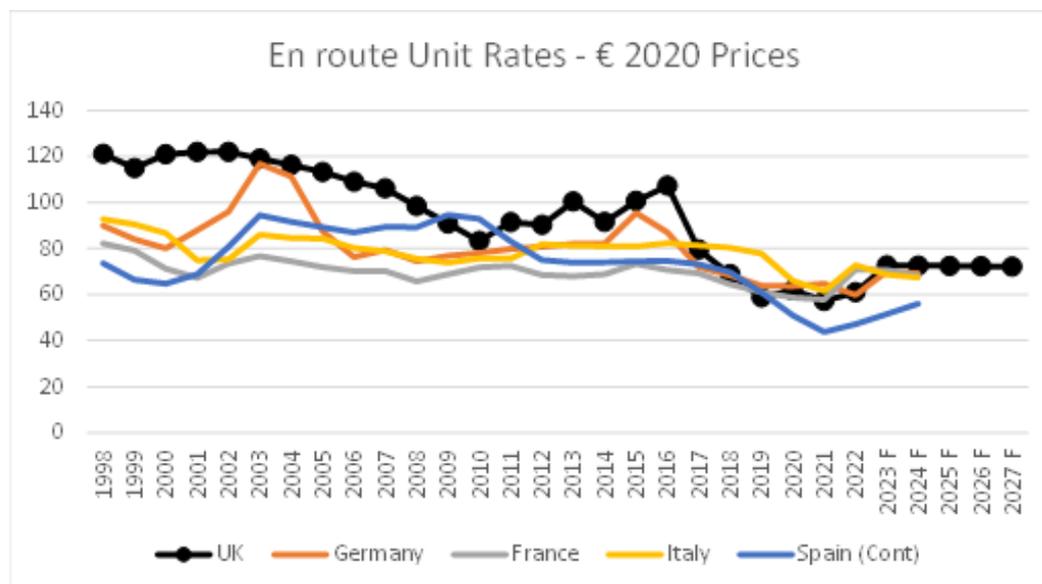
Source: CAA analysis of Eurocontrol unit rate dashboard and CAA's IPs (flat)

F22 The UK's unit rates have been, in recent years, similar to (or lower than) those of countries with comparable ANSPs. While, under our Initial Proposals, UK unit rates would increase in NR23 compared with 2022, they would still be reasonably close to those of other comparable countries. Also, the UK's unit rates have recently declined faster than comparators and there is a long-term

<sup>72</sup> <https://www.eurocontrol.int/ServiceUnits/Dashboard/EnRouteUnitRates.html>. NERL charges account for the vast majority of the UK Unit Rate.

trend of UK convergence towards comparators (since UK unit rates were historically higher), as shown in Figure F.4 below.

**Figure F.4: Comparison of en route unit rates – NR23 Initial Proposals**

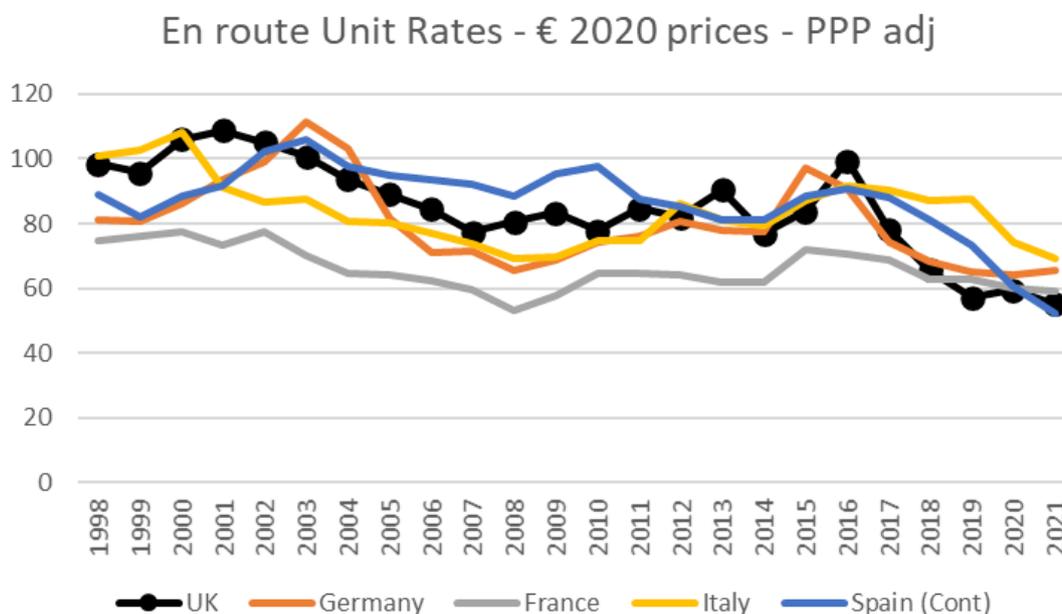


Source: CAA analysis of Eurocontrol unit rate dashboard, June 2022 CRCO tables and CAA Initial Proposals (flat).

Note: Comparator unit rates for 2022-2024 are based on States' submissions in June 2022 to CRCO. These submissions were produced in a different context and for a different timeframe to our IPs for NR23. EU states revised their numbers in mid-2021, at a time of greater uncertainty and still very much focused on cost-containment for their RP3 period (up to 2024), so it is possible that these numbers will change somewhat over the NR23 period.

F23 This long-term convergence may to some extent be explained by the relative weakening of Sterling against the Euro. Adjusting for purchasing power parity, UK unit rates have been comparable to those in other European countries, particularly in recent years (see Figure F.5 below).

Figure F.5: Comparison of en route unit rates – PPP adjusted

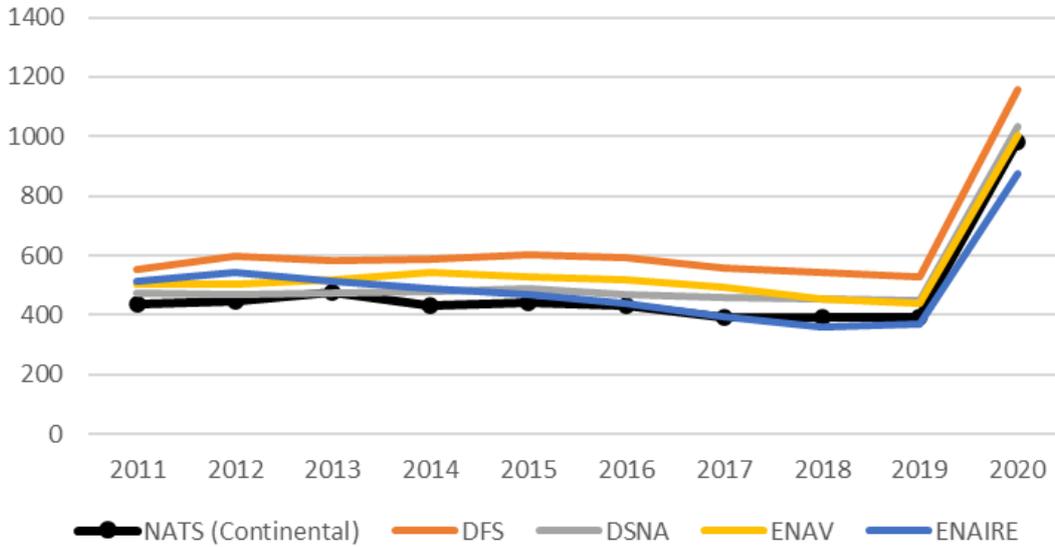


Source: CAA analysis of Eurocontrol unit rate dashboard

- F24 We have also compared NERL's costs per composite flight (a headline PRU benchmarking metric) with those of four comparator ANSPs: DFS (Germany), Enaire (Spain), ENAV (Italy) and DSNNA (France). We used the Eurocontrol's ACE (ATM Cost-Effectiveness) dashboard and benchmarking reports to source this unit cost information.<sup>73</sup>
- F25 NERL's costs per composite flight has generally been below the average of comparators and generally, NERL costs seem comparable with the main ANSPs in France, Italy, Germany and Spain. That said, even though the selected comparator group may well be the most appropriate given the UK's operational and economic environments, these are a relatively expensive group of ANSPs (in nominal terms), compared with others in Europe and the US (see paragraphs F17 and F18 above).

<sup>73</sup> These are available at <https://www.eurocontrol.int/ACE/ACE-Home.html>

**Figure F.6: ATM/CNS costs per composite flight-hour (EUR)**

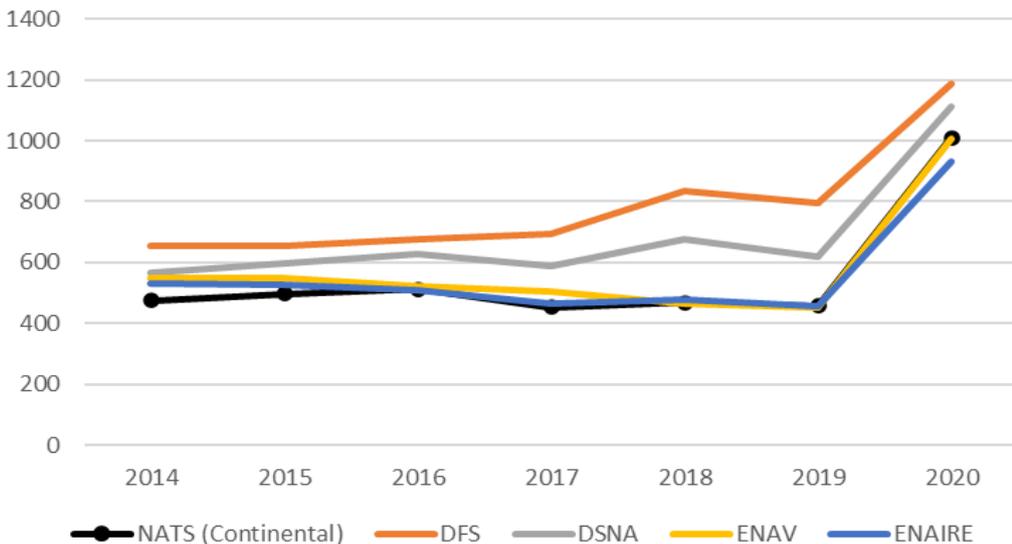


Source: CAA analysis of Eurocontrol’s benchmarking data

**The service levels and performance that is being provided by NERL in return for its charges compared with that provided by comparator ANSPs**

F26 We considered NERL costs per composite flight metric also taking into account delay costs to users, with those of four comparator ANSPs: DFS (Germany), Enaïre (Spain), ENAV (Italy) and DSNA (France). The Economic Cost Effectiveness indicator in ACE Benchmarking reports add the costs of delays to users to the provision costs per composite flight-hour. NERL ranks particularly well against some comparators when delay costs are also taken into account, particularly before the traffic downturn (see Figure F.7 below).

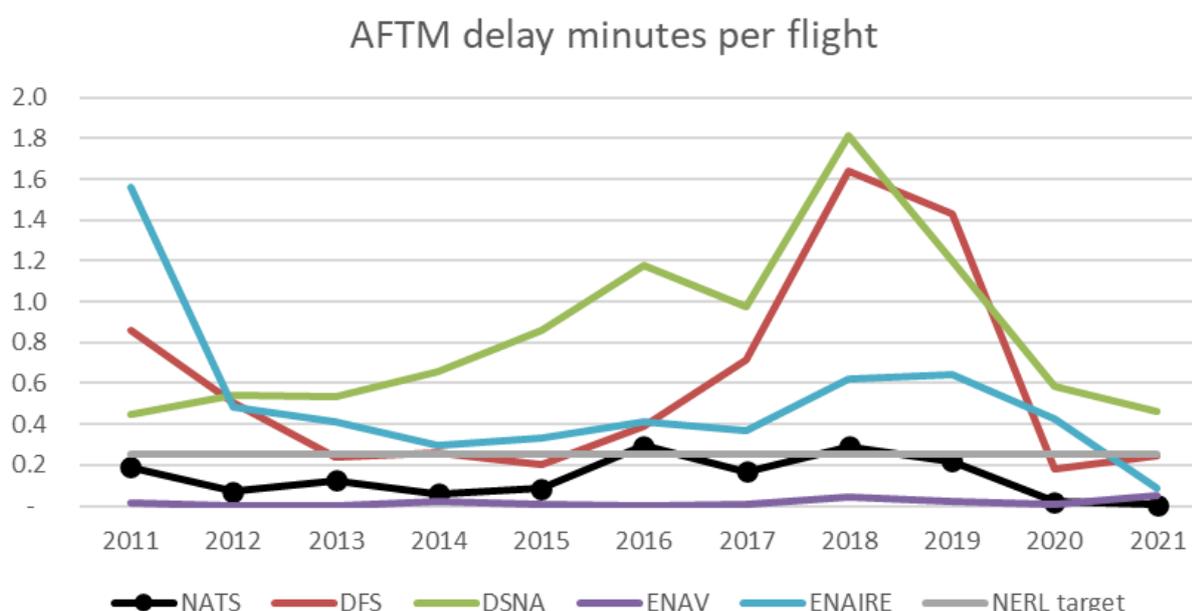
**Figure F.7: Economic Cost Effectiveness (EUR)**



Source: CAA analysis of Eurocontrol's ACE benchmarking data

F27 This is because NERL delays experienced by airspace users have been lower than comparators (See Figure F.8) for unit rates and unit costs that are broadly similar. With the traffic downturn due to covid-19 delays fell significantly across Europe, but recovery will be expected to put pressure on ANSPs' service performance.

**Figure F.8: AFTM delay minutes per flight**



Source: CAA analysis of En-route IFR flights and AFTM delays in [ansperformance.eu/data/](https://ansperformance.eu/data/)

F28 Overall, NERL charges appear to be providing value for money to airline customers and passengers when compared with comparable international ANSPs. For NR23, NERL proposed to maintain a target of approximately 0.25 minutes for AFTM delay per flight.<sup>74</sup> Our Initial Proposals are that the target for NERL's all-cause AFTM delays should be approximately 0.2 minutes per flight

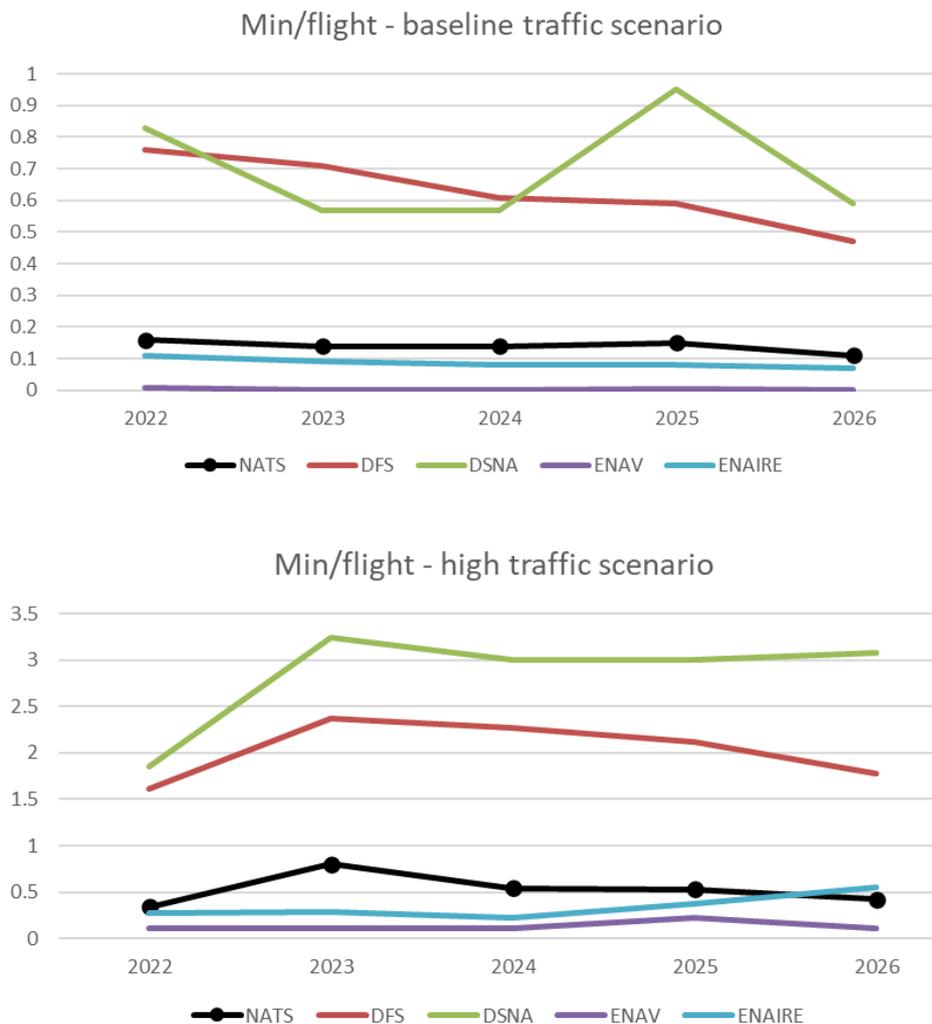
F29 According to the European Network Operations Plan 2022-2026, the UK is expected to have sufficient capacity to meet the baseline traffic forecast scenario, resulting in forecast delays that are below 0.2 minutes per flight.<sup>75</sup> There would only be a capacity gap for the high traffic growth scenario, resulting in forecast delays of between 0.3 and 0.8 minutes per flight in 2022-2026. DFS and DSN are expected to continue to have significant delays in 2022-2026 both in the baseline and high traffic scenarios, while ENAIRE is expected to have

<sup>74</sup> See page 5 of Appendix E of NERL's Business Plan

<sup>75</sup> See pages 203 and 204 of the European Network Operations Plan 2022-2026, available at [www.eurocontrol.int/publication/european-network-operations-plan-2022-2026](http://www.eurocontrol.int/publication/european-network-operations-plan-2022-2026).

sufficient capacity to meet baseline traffic scenario, with its forecast delay exceeding reference values in the high-traffic scenario. ENAV’s low delay forecast seems to reflect that it plans to provide sufficient capacity to meet its delay targets even in a high-traffic scenario, in contrast with forecasts for NERL and other comparators. This is shown in Figure F.9 below.

**Figure F.9: Forecast AFTM delay minutes per flight by traffic scenario**



Source: European Network Operations Plan 2022-2026

**The materiality of NERL’s charges and the likely significance of NERL’s charges to passengers and airlines**

F30 Navigation charges from all ANSPs globally represent between 3% to 9% of airline revenues, depending on the airline business model and route network.<sup>76</sup> ANSP charges tend to be at the bottom end of this range for full-service carriers with significant long-haul operations like Virgin and British Airways, and at the

<sup>76</sup> Source: CAA analysis of UK airline financial data for 2019

top end of the range for short-haul low-cost airlines. For comparison, fuel costs can vary significantly from year to year and can represent between a quarter to a third of airline revenues in a typical year.<sup>77</sup>

- F31 NERL's charges relative to the overall consumer ticket prices are as follows:
- in 2019, NERL's en route charges were approximately £1.67 per passenger and Determined Costs were about £1.95 per passenger<sup>78</sup>;
  - based on numbers from NERL's business plan, we estimate that its en route charges would be £2.31 per passenger over NR23, with £0.35 of that being the 75% of the covid TRS debtor being recovered during NR23<sup>79</sup>; and
  - under our Initial Proposals, NERL's en route charges would be £2.03 per passenger over NR23, with £0.23 of that relating to TRS revenues – to be recovered evenly over NR23 and NR28.

- F32 These figures indicate that, for across a range of different types of airlines, changes in NERL's charges within the ranges set out in these Initial Proposals should have a relatively small impact on airlines' costs and also on ultimate ticket prices experienced by passengers.

### **How other European ANSPs are planning to recover their Covid related TRS debtor costs**

- F33 Covid has had a significant impact on all ANSPs' revenues in 2020 and 2021. The UK was relatively more impacted than the rest of Europe in 2021, when UK traffic was down 56% on 2019 levels, compared with 46% down for CRCO region.<sup>80</sup>
- F34 It has been difficult to compare the recovery of the TRS shortfall with European comparators as the EU plans and forecasts conclude in 2024, while recovery of revenues has been extended beyond that. However, based on the information we have seen, EU ANSPs seem to have spread the recovery of their covid revenue shortfalls evenly over 5, 6 or 7 years. This means that for comparator countries, the recovery of covid revenue shortfalls is expected to represent between 14% to 17% of Determined Costs in 2023 and 2024, as shown in Table F.1 below.

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<sup>77</sup> Source: CAA analysis of UK airline financial data for 2019

<sup>78</sup> Source: CAA analysis of NERL NR23 business plan appendix C and appendix I and assuming 129 passengers per flight, as per Eurocontrol's standard inputs for economic analyses

<sup>79</sup> Source: CAA analysis of NERL NR23 business plan appendix C and appendix I and assuming 129 passengers per flight, as per Eurocontrol's standard inputs for economic analyses

<sup>80</sup> Source: PRU, Aviation Intelligence Portal, "COVID-19 – Impact on en-route revenues and service units" page, available at [https://ansperformance.eu/covid/covid\\_ert\\_rev/](https://ansperformance.eu/covid/covid_ert_rev/)

F35 NERL's business plan proposed unit rate increases that would be comparable to this (TRS debtor being approximately 18% of Determined Costs over the NR23 period as noted above). We propose a covid TRS recovery effort of approximately 13% of Determined Costs during NR23, but equally spread over the 10 years of NR23 and NR28.

**Table F.1: Spread of covid revenue shortfalls' recovery in comparator countries**

	Covid revenue shortfall £m	No. of years	Covid revenue shortfall per year as a % of Determined Costs (2023/24)
<b>France</b>	1,488	7	15.2%
<b>Germany</b>	885	6	14.4%
<b>Italy</b>	588	5	17.30%
<b>Spain</b>	624	7	14.10%

Source: CAA analysis of ETNA submissions on 1 June 2022

F36 The NR23 unit rates proposed by NERL in its business plan still result in large headline increases in unit rates (around 35%) from 2023 compared with 2019. A more extended recovery profile for the covid-19 TRS debtor, and a flat or increasing unit rate profile (so that unit rates would be constant over, or higher later in, NR23, when traffic is also expected to be higher) may support recovery in the short-term and allow airlines and consumers more time to adapt to higher unit rates.

## Our Initial Proposals

F37 Our analysis set out above indicates that:

- NERL's charges on an en route unit rate basis have been similar to (or lower than) those of comparable ANSPs. Its unit rate has recently declined faster than comparators and there is a long-term trend of convergence towards comparators (NERL rates were historically higher);
- generally, NERL's charges appear to be providing value for money to airline customers and passengers when compared with those of comparable international ANSPs. For example, NERL delays experienced by airspace users have been lower than those of comparators for unit rates that are broadly similar;

- NERL's charges form a small proportion of airlines costs and of the ultimate ticket prices experienced by passengers even in respect of low-cost carriers. This materiality is unlikely to be significantly affected by the proposed increase in charges as we estimate that NERL's charges will increase from £1.67 per passenger in 2019 to £2.03 per passenger over NR23; and
- although evidence for other countries is limited, the TRS debtor recovery plan in these proposals is reasonably comparable to what we know of what other countries might do.

- F38 This analysis indicates that taking account of our Initial proposals then NERL's charges are likely to be broadly similar to those of comparators and to deliver comparable or slightly better levels of service over NR23. We do not find evidence that our Initial Proposals for NERL's charges, even taking into account the forecast increases in charges over NR23, will lead to significant affordability concerns.
- F39 While our analysis has not raised any specific concerns regarding the likely affordability of NERL's future charges, there are material increases in costs and charges over NR23 for consumers and customers. These, for example, are due to the high level of protection provided to NERL from recovery of the shortfall in revenues during the period 2020-2022 resulting from the impact of covid-19.
- F40 Consistent with our statutory duties, we have considered actions to ensure that charges represent economic and efficient costs, provide value for money, and are no higher than necessary to broadly support users in re-establishing and operating services, given the difficult circumstances created by covid-19. This has been balanced with consideration of our duty around the financeability of NERL.
- F41 In addition to setting allowances for efficient costs that provide for an appropriate level of service, we are also consulting on proposals that reduce NERL's proposed increase in charges, particularly in the short-term. This includes reprofiling the recovery of the covid-19 TRS debtor over NR23 and NR28.

## APPENDIX G

# The capex engagement incentive

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## Background

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- G1 Encouraging high quality engagement between NERL and its customers is an important part of our approach to the economic regulation of NERL and is key to our work that seeks to ensure that the capex NERL incurs furthers the interests of users and consumers.<sup>81</sup> Engagement also promotes efficiency and economy by NERL through the review and challenge that stakeholders provide to NERL's plans. Done well, engagement should help NERL in discharging (and demonstrating that it is discharging) its duties under section 8 of the TA00.<sup>82</sup>
- G2 For RP3, the CMA said that the CAA should introduce a capex engagement incentive (now in condition 10 of NERL's licence). The current approach to these incentives involves scoring by an Independent Reviewer appointed by the CAA (currently consultancy firm Egis) to operate a "penalty only" incentive promoting high quality stakeholder engagement by NERL on its capex plan. For RP3, the incentive scores NERL's engagement on a range from 1 (weak) to 5 (excellent) for each of six assessment criteria. The scores are averaged over projects and programmes covering 93% of NERL's capex.<sup>83,84,85</sup> NERL will avoid incurring a penalty under this incentive if its score under the incentive scoring criteria reaches 3 ("Average") or above.
- G3 For NR23, we propose to refine the current engagement incentive, which has operated since 2021. While the incentive is relatively new, both we and the Independent Reviewer have learned a significant amount about the practical operation of the incentive. The scoring reports provided to us by Egis on NERL's engagement indicate that the incentive appears to be having a positive effect, but that there are areas where NERL could improve its performance and we can

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<sup>81</sup> Examples of NERL's capex projects for NR23 include investment in sustainment of its existing technology, investment in replacing ageing systems and investments to facilitate the modernisation of airspace such as systematisation of terminal airspace and delivering free route airspace. Some elements of NERL's capex programme, such as DP en route have been underway for some time and will continue into NR23.

<sup>82</sup> For a description of these duties, please see the discussion of the legal framework in appendix A.

<sup>83</sup> We decided on this approach following consultation with stakeholders in 2021. See; <https://www.caa.co.uk/media/ae3kqoh1/20210826-nerl-capex-engagement-decision.pdf>

<sup>84</sup> Any penalty is capped at NERL's rate of return on its actual capex during RP3.

<sup>85</sup> The CAA's Guidance on NERL's capital expenditure engagement incentive is set out at <https://www.caa.co.uk/media/eugbl5hz/nerl-capex-engagement-incentive-guidance.pdf>

improve the operation of the incentive.<sup>86</sup> Bearing Egis' reports in mind, we are exploring how best to strengthen in a proportionate way the incentive on NERL further to improve engagement with its stakeholders on its capex plan during NR23.

- G4 The importance of high-quality engagement will also be heightened by NERL's adoption of the "2+5" process for capital planning, governed through the SIP process. In this approach, NERL uses a fixed two-year capital plan together with a more flexible five-year investment roadmap agreed through the price control process. NERL will use this to develop rolling two-year detailed plans, while collaborating with stakeholders on strategic intent and preferred options for future years.
- G5 We see the benefits of NERL's capital planning process becoming more flexible, not least in enabling NERL to react to changing circumstances. However, in order to enable NERL to benefit from this flexibility in the interests of users, users must be able to input into the planning process effectively, including understanding how plans have evolved. This places more importance on the planning process and, so, also means that it is important that NERL is incentivised appropriately to continue its efforts to improve in this area. As a result, we have considered how the capex engagement incentive might evolve to address these new challenges and opportunities.

### **How the capex engagement incentive has worked during RP3**

- G6 Egis conducted its initial scoring on the iSIP21 and has assessed NERL's final score on the basis of the iSIP22. As noted above, the incentive appears to be driving better engagement by NERL, especially in terms of the improved quality, clarity, consistency and traceability of NERL's consultation materials. Egis' initial score under the incentive, based on NERL's iSIP21 was "Average", indicating that NERL would avoid incurring a penalty if it maintained its performance. Subsequent assessments indicate continued progress, for example, in the presentation of the information provided and the introduction of a "key achievements" section that provides an overview of progress against the plan in the previous year.
- G7 Indeed, by the time of the publication of the iSIP22, Egis was able to describe the material presented as a "strong document" that further built on earlier improvements and took into account previous comments on the way the material was presented and was understandable by non-expert readers.

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<sup>86</sup> Egis' scoring reports are published alongside these Initial Proposals at <https://www.caa.co.uk/commercial-industry/airspace/air-traffic-management-and-air-navigational-services/air-navigation-services/nats-en-route-plc-nerl-licence/>

- G8 Even so, there remain areas for improvement. For example, Egis’s report on the iSIP22 indicates that:
- improvements in the readability and transparency had also introduced additional length into the materials;
  - not all the materials were sufficiently well structured for readers to be able to extract the key points;
  - invitations for stakeholders to provide comments were not consistently signposted;
  - the key drivers of the “RAG status” of particular projects was not always clear;
  - the traceability of changes to the way some programme milestones are presented back to the initial programme milestones could be improved; and
  - some programme updates appear to have been carried over from the SIP to the iSIP without amendment.
- G9 In the light of the reviews that Egis has undertaken, Egis’ final scoring report on NERL’s overall performance has given NERL an overall score within the range of between “Average” and “Good” under the scoring criteria for the capex engagement incentive. Egis draws attention to the improvements that NERL has made to its reporting since the SIP2021, including through the:
- noticeable effort made by NERL to improve the accessibility of the information provided to users; and
  - additional dedicated user consultation that NERL has conducted on the context of the highly important “DP En-route and voice” programme, aimed at ensuring future planning is aligned to user requirements.
- G10 Egis has continued to identify areas, such as consistency, the impacts of changes to the plan and corrective actions where improvements can still be made as well as indicating that optioneering is likely to become much more of an important feature of SIP reports during NR23.
- G11 Having considered the iSIP22 and Egis’ reports not only on it, but also the trajectory of NERL’s performance in relation to engagement with users on its capex programme since the start of 2021, we propose to adopt Egis’s findings in relation to NERL’s score under the capex engagement incentive. As a result, we do not propose to impose any penalty on NERL for its performance under this incentive as part of the NR23 price control decisions.

## Egis' review of the engagement incentive

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- G12 While we note NERL's improving performance during 2021 and 2022 in this area, engagement on capex will continue to be vital for NR23 as NERL seeks to deliver complex capex programmes including on airspace modernisation and legacy escape. Though we do not consider it necessary to make fundamental changes to the incentive at NR23, we consider that this price control review allows us to improve our approach and that we should seek to drive continuous improvement on the part of NERL. We also want to identify areas where our incentive guidance could be more practical and useable, and improves how well it is driving desirable behaviours.
- G13 In this light, we commissioned Egis to review the working of the current incentive with a view to identifying potential improvements.<sup>87</sup> We also sought to pick up issues that stakeholders raised in response to our consultation in 2021, notably:
- whether the weightings given to programmes and projects should remain linked to the actual spending on each programme and project; and
  - whether the baseline expectation on NERL's engagement should be increased from 'average' to 'good'.

## Summary of Egis' recommendations

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- G14 Egis' report recommended that we consult on a number of aspects of the capex engagement incentive which are summarised below.
- G15 Scoring: Overall, Egis's report indicates that the scoring process appears to be achieving its primary aim, resulting in valuable discussions with NERL about what is expected of it, with NERL appearing keen to consider how it can do well.
- G16 However, Egis considers that:
- the current guidance makes it hard to distinguish clearly between different scores;
  - for some criteria, there is insufficient evidence to develop a score (largely due to the short period the incentive has run for);
  - changes to the scope of programmes can create difficulties in changing the weighting of individual programme scores and this may become more of an issue during NR23;
  - more guidance could be provided on the schedule of scoring;

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<sup>87</sup> Egis' report is published alongside these Initial Proposals. The terms of reference are set out at slide 5 and the existing scoring framework summarised on slide 6.

- the CAA should clarify that other engagement activities are not in scope; and
  - there may be merit in obtaining customer feedback on NERL's performance (without removing responsibility for scoring from the Independent Reviewer).
- G17 Criteria: Egis considers that it could be helpful to include more information on the definitions for each score and clarifications, including making clear that:
- "timeliness" includes timeliness of mitigating/corrective actions;
  - "user focus" includes traceability of information (especially milestones and financial information); and
  - "optioneering" includes the benefits of options and the opex impact of capex changes.
- G18 Egis notes that the current incentive is based on the assessment of four criteria for engagement, and only two on actions in response to that engagement. The effect of this is that NERL's actions in response to engagement have less influence on the overall score. To address this, Egis considers that it may be worth combining some criteria or weighting them to give an equal balance between the quality of engagement and NERL's response to stakeholders' feedback. Specifically, Egis' view is that combining "timeliness", "user focus" and "proportionality" may provide the greatest benefit, as it would lead to there being two criteria for each of "quality of engagement" and "actions in response".
- G19 Addressing NERL's "2+5" approach to the capex plan: While the adoption of a "2 + 5" approach to capex planning may facilitate greater flexibility in the capex planning process and enable engagement with stakeholders to have greater influence, Egis considers that the guidance should address how NERL should reflect its "2+5" approach to capex planning in its consultations. It considers that stakeholders' views should be sought on the structure of the consultation and its impact on engagement scoring.
- G20 Weighting the projects and programmes: Egis considers that customers are interested both in projects which strongly contribute to costs and those which strongly contribute to benefits or user priorities, but these do not necessarily overlap. To address this, it suggests that either:
- an "importance score" could be given to each project, potentially in consultation with stakeholders; or
  - equal weighting could be given to "airspace projects" (such as the existing "airspace and ops" and "AD6" projects) and "system capex" (such as the existing "DP Enroute and voice", "sustainment and surveillance" and "property and facilities management" programmes); as well as

- providing for flexibility and further consultation with users on the application of the priorities might be needed.

G21 General matters: Egis considers that:

- a penalty only regime remains appropriate as a “bonus” would charge airspace users for high quality engagement;
- as NERL has had the opportunity to learn about the application of the scheme, there could be merit in changing the expectation to “good” for NR23; and
- it would be beneficial to clarify that other engagement activities are not in the scope of the capex engagement incentive.

## Initial Proposals

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G22 As noted above, we do not propose to include any penalty under the current capex engagement incentive in the NR23 settlement.

G23 Taking into account our views and those from Egis, we propose to retain the capex engagement incentive for NR23, and propose the following refinements to it which we consider will strengthen and clarify how it will operate during NR23:

- the score that NERL should be expected to reach in order to avoid a penalty should be increased to a higher “baseline” expectation, broadly drafted along the lines of the current “good”;
- the number of criteria should be reduced from six to four and, with two each for quality of engagement and NERL’s response to issues raised;
- we should clarify the scoring criteria, including what we expect from NERL in engaging on changes to the capex plan. As a result, as suggested by Egis, we propose to clarify the criteria to ensure that they capture timeliness of mitigating/corrective actions, are more explicit about the importance of the traceability of information (especially milestones and financial information) and ensure that the consideration of optioneering includes the benefits of options and the opex impact of capex changes. These changes should help address issues raised by the “2+5” approach to capex planning;
- we should keep under review during NR23 the need for further consultation with stakeholders on the weighting of projects; and
- stakeholders should have an opportunity to express their views on the quality of NERL’s engagement to the Independent Reviewer.

G24 We do not propose to make any changes in the following areas:

- the incentive should remain “penalty only” to avoid NERL earning incremental income for what should be a normal and expected activity;

- the incentive should not cover opex as this is incentivised by the element of the regulatory framework setting NERL's opex allowance; or
- creating a mechanism under which the approval of users would be required for capex projects to move from the "+5" timescale within the capex plan to being delivered in the "+2" timescale.

G25 We consider that these changes (discussed in more detail below) would further the interests of users by driving proportionate improvements, in both the clarity and effectiveness of NERL's engagement compared to the existing incentive arrangements, and further promoting economy and efficiency by NERL by strengthening the incentive to obtain and respond to better targeted feedback on its capital plan. We would not expect these changes to create a material increase in the regulatory burden on either NERL or customers.

### Setting a higher baseline expectation

G26 As noted above, we consider that there is merit in increasing the "baseline" score that NERL is required to achieve to avoid a penalty. This would encourage NERL to improve on its recent scores of "average" and drive continuous improvement by setting expectations under the incentive at a higher level than that currently in place. We therefore propose to require NERL to meet a standard equivalent to the existing score of "good" to avoid a penalty.

G27 However, given that NERL's performance is currently well in excess of the standard described as "weak" in the current scoring guidance and Egis' comments about the overall complexity of the scheme at present, we consider that as well as implementing a higher required standard to avoid a penalty, we should also simplify the scoring framework by reducing the number of scores from five to four, by removing the bottom end of the performance scores. This results in a revised scoring framework as follows:

- 1 – poor (now being the lowest score, after removing the score "weak"). This would be based on previous "poor" performance;
- 2 – below expectations - changed from "poor". This would be based on previous "average" performance;
- 3 – baseline expectations. This would be based on previous "good" performance; and
- 4 – excellent. This would be based on previous "excellent" performance.

G28 We do not consider that this approach should necessarily have any impact on the manner in which the financial incentive should be applied to NERL's engagement.

G29 As at present:

- the maximum penalty would be capped at NERL's rate of return on its actual capex in the price control period;
- scores would be rounded to the nearest 0.1;
- no penalty would be applied for a weighted average overall score of 3 or above, with penalties only being applied below that score;
- penalties would be applied to performance scoring below 3, with the maximum penalty being applied to a score of 1.5 or below;
- the level of penalty would increase linearly with the level of underperformance up to the penalty cap.

### Reducing the number of criteria scored

G30 Noting Egis' comments, we consider that there is merit in reducing the number of criteria scored from six to four: two each for "quality of engagement" and "response to engagement". This would involve combining "timeliness", "user-focus" and "proportionality" into a single expanded criterion. We propose to give each of the four new criteria (the expanded "user focus", "optioneering", "responsiveness" and "mitigating/corrective actions") equal weight as the changes NERL makes in response to its engagement will be important over the period of NR23 and in the context of a "2+5" capex plan.

### Developing the scoring criteria

G31 As noted above, we propose to clarify the criteria to ensure that they capture timeliness of mitigating/corrective actions, are more explicit about the importance of the traceability of information (especially milestones and financial information) and ensure that the consideration of optioneering includes the benefits of options and the opex impact of capex changes. There is a clear need for NERL to engage clearly and transparently on changes to project scope and project milestones. To address this, we consider that the criteria should be clarified to make clear that NERL should be explicit about:

- changes to the project scope;
- specific deliverables moving between projects;
- changes to project milestones;
- areas where elements of projects are no longer planned to be delivered;
- where the delivery dates for specific elements of projects are planned to be delivered later;

- reconciling changes to the scope and timing of elements of the capital plan to the delivery of the specific benefits that would accrue from those elements and how those relate to/have changed from the equivalent aspects of the equivalent projects/programmes as previously consulted on;
- its approach to optioneering;
- how the choices considered as part of its optioneering would deliver not only benefits but also the opex impact of each candidate option; and
- the consequential changes to the overall capex plan that any such changes bring.

G32 In each case, we consider that the scoring should base the assessment of NERL's engagement on how well it communicates changes as compared to both the "baseline" SIP it publishes at the start of the NR23 period and the latest SIP or interim SIP published.

G33 We consider that this clarification would significantly assist NERL in understanding what is required from it, not only in terms of engagement generally, but also in being clear about the "traceability" of elements of the capex plan as it evolves over time. We consider that this would greatly benefit stakeholders in their understanding of NERL's intended approach to capex and how it evolves over time.<sup>88</sup> The reconciliation of changes to the capex plan to the delivery of the expected benefits of elements of the plan will also help NERL to demonstrate how it is delivering on its duties under section 8 TA00 and the CAA's assessment of that performance.

G34 Taking these changes together, our initial proposal is that the scoring criteria could be revised as set out in Table G.1 below.

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<sup>88</sup> We also consider that this approach could also be helpful in providing evidence as to whether a change to "forward looking" capex incentives might become appropriate at any future price control, albeit that no such change is proposed for NR23.

Table G.1: Draft Revised Guidance on scoring

	Underperformance		Baseline expectations (3)	Excellent (4)
	Poor (1)	Below expectations (2)		
<b>1. User Focus, including timeliness of information, traceability and proportionality</b>	<p>Some delay in providing information, limited early warning of factors that may affect delivery.</p> <p>Unclear, inaccessible or perfunctory provision of information with limited regard for user priorities and resource constraints.</p> <p>Limited additional information provided for material changes in capex plan and unclear on traceability of changes back to previous plans.</p>	<p>Information provided in a timely manner, reasonable early warning (where possible) of factors that may affect delivery.</p> <p>Reasonably clear and accessible information provided with reasonable regard for user priorities and resource constraints.</p> <p>The level of substantiation provided reasonably reflects the materiality of the change under consideration but does not allow users systematically to trace changes to the plan to previous plans.</p>	<p>Information provided proactively and promptly, strong early warning and (where relevant) explanation of factors that may affect delivery.</p> <p>Clear and accessible information with good regard for user priorities and resource constraints. Comprehensive substantiation for all material changes in capex plan under consideration, including clear traceability of all material changes to both the last version of the capex plan consulted on and the first version of the capex plan consulted on during the NR23 period.</p>	<p>Information provided proactively and promptly, excellent quality early warning and explanation of factors that may affect delivery.</p> <p>Extremely clear and accessible information with excellent consideration of user priorities and resource constraints.</p> <p>Excellent substantiation for all material changes in capex plan under consideration and comprehensive traceability of all changes to both the last version of the capex plan consulted on and the first version of the capex plan consulted on during the NR23 period.</p>
<b>2. Optioneering</b>	<p>Poor information on the overall approach to optioneering adopted.</p> <p>Limited information on alternative options presented (including limited discussion of opex interactions), limited opportunity for meaningful</p>	<p>Limited information on the overall approach to optioneering adopted.</p> <p>A range of different options identified where possible (including explicit consideration of opex interactions), reasonable opportunities for</p>	<p>Good information on the overall approach to optioneering adopted.</p> <p>Good information provided on a range of alternative options where possible (including explicit consideration of opex interactions), good</p>	<p>Excellent information on the overall approach to optioneering adopted.</p> <p>Excellent information provided on alternative options where possible (including explicit consideration of opex interactions), extensive</p>

	scrutiny of relative merits of different options by users and IR.	meaningful user and IR engagement and scrutiny.	opportunities for meaningful user and IR engagement and scrutiny.	opportunities for meaningful user and IR engagement and scrutiny.
<b>3. Responsiveness</b>	Perfunctory response to user and IR submissions, insufficiently clear how these submissions have been accounted for.	Generally constructive response to user and IR submissions, reasonably clear explanation of how these submissions have been accounted for.	Engaged and constructive response to user and IR submissions, clear explanation of how these submissions have been meaningfully accounted for.	Engaged and highly constructive response to user and IR submissions, very clear evidence that submissions have been meaningfully accounted for after substantial consideration.
<b>4. Mitigating/ corrective actions</b>	Limited evidence of mitigating and/or corrective actions, where appropriate, following user and IR submissions.	In most cases reasonable mitigating and/or corrective actions taken, where appropriate, following user and IR submissions. Actions communicated to stakeholders.	In almost all cases appropriate mitigating and/or corrective actions taken promptly, where appropriate, following user and IR submissions. Actions clearly explained to stakeholders.	In all cases appropriate mitigating and/or corrective actions taken promptly and proactively, where appropriate, following user and IR submissions. Actions very clearly explained to stakeholders.

Notes:

“timeliness” includes not only the timeliness of the overall engagement with stakeholders, but also the timeliness of responding to stakeholders’ feedback;

“traceability” applies to identifying where specific deliverables and costs have either changed or moved between projects or programmes. Traceability should be such that changes to deliverables, project milestones, project costs and benefits can be clearly identified between the plans published by NERL over time. NERL should reconcile those changes to deliverables, project milestones and project costs to the delivery of the specific benefits that would accrue from those elements and any impacts on opex or other capex projects. Traceability should also indicate those elements of projects that are no longer planned to be delivered or which NERL plans to deliver later. Particular attention should be given to addressing the traceability of changes to those elements of the capital plan that are to be delivered in the two years following the date of the Service and Investment Plan in question; and

“optioneering” includes not only the setting out how NERL has considered different options and seeking stakeholders’ views on them, but also the benefits of those options and the opex impact of changes to the capex programme the consequential changes to the overall capex plan that any such changes bring.

## Weighting of projects/programmes

- G35 Egis has set out two options for changing the weighting of projects/programmes with the intention of better reflecting the preferences of stakeholders in the scoring of the engagement incentive:
- providing an importance score to each project, potentially in consultation with stakeholders; or
  - providing equal weighting to “airspace” projects and “system capex” and providing for further consultation with users on the application of priorities.
- G36 On weighting of projects, we are not currently persuaded that either giving a set weighting to “airspace projects” and “system capex” projects or giving each project an “importance score” would provide significant benefits over the current approach, as this increases complexity and subjectivity and could distort incentives as requirements and the capex programme change over NR23.
- G37 We consider that the importance to stakeholders of particular projects such as “DP En Route” would be more accurately reflected through stakeholder feedback informing the CAA as to selection of the projects subject to the incentive. As a result, we propose to continue the current approach of selecting projects based on stakeholder views and weight the selected projects in accordance with the forecast capex spend.
- G38 During NR23 we expect to revisit the selection (and, hence, weighting) of projects and programmes subject to the incentive. This may be particularly important if significant changes in the overall programme emerge, including changes to project scope and project milestones and splitting existing projects, terminating projects or commencing new ones. Where there are significant changes in weighting of projects and it is proportionate to do so, we will carry out further consultation on the selection (and hence comparative weighting) of projects and programmes within the incentive.

## Incorporating stakeholder views

- G39 As for the use of stakeholders’ views within the scoring process by the Independent Reviewer, we consider that the Independent Reviewer should have the ability to seek users’ views on the quality of NERL’s engagement in carrying out its assessment. Given that the most important element of the capex engagement cycle should be the publication of the annual SIP at the end of January each year, we consider that this should, in most cases take place annually to coincide with the Independent Reviewer’s assessment of it. That said, we consider that there may be some merit in allowing the Independent Reviewer some discretion in how and when it seeks stakeholders’ views and welcome stakeholders’ views on the best and most proportionate means for it to do so.

## Next steps and views invited

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- G40 We would welcome views on any of the issues raised in this appendix and in particular on:
- not including any penalty on NERL for its performance under the capex engagement incentive in 2021 and 2022;
  - whether our proposed changes are appropriate to incentivise continuous improvement in NERL's capex engagement;
  - whether simplifying the scoring process will target the incentive more closely on driving stronger engagement with users;
  - whether our approach to scoring optioneering is appropriate for changes that NERL may consult on to be delivered towards the end of the "2+5" period; and
  - whether any the engagement process should incorporate additional input from users.