

Appendix I: Determined costs, DUCs and prices

Determined costs are the components of the regulatory cost base for our en route and oceanic businesses which we recover from customers via the unit rate charges for each service.

Throughout this appendix, 2019 actual costs are used as the principal reference point for analysis of the NR23 cost base as this was the most recent pre-pandemic year, and traffic is expected to recover to 2019 levels by 2025. Where appropriate, we have also compared the NR23 cost base against the RP3 plan for 2020-22.

Determined cost projections

Our determined cost building blocks are shown in the tables below at total NERL level, as well as for the UK Air Traffic Services (UKATS) and oceanic services.

The UKATS and oceanic costs are derived from the total NERL cost base using a cost allocation methodology previously reviewed by the CAA as part of the RP3 process¹. The cost allocation methodology and service line drivers have not materially changed since the CAA's RP3 review, and therefore we consider that it remains appropriate.

¹ CEPA 2019, NERL's Cost Allocation and Non-Regulatory Income Forecasts

Total NERL determined costs

CY, 2020 prices, £m	2019	2020	2021	2022	2023	2024	2025	2026	2027	NR23 total
	<i>Actual</i>	<i>Actual</i>	<i>Forecast</i>	<i>Forecast</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	
Operating costs										
<i>Staff costs</i>	286	277	243	256	263	272	275	279	284	1,373
<i>Non-staff costs</i>	151	127	121	150	153	157	157	157	153	777
<i>Exceptionals & one offs</i>	4	56	(20)	2	3	3	3	3	3	14
Sub total: operating costs	439	461	344	408	419	432	436	439	440	2,166
Cash pensions										
<i>Cash pensions: defined benefit</i>	69	69	67	66	87	86	84	84	82	424
<i>Cash pensions: defined contribution</i>	10	12	12	14	16	17	19	20	22	93
<i>Cash pensions: PCA</i>	17	16	13	13	12	11	10	9	8	49
Sub total: cash pensions	97	98	92	93	115	114	113	113	112	566
Regulatory depreciation	180	201	165	145	129	138	137	138	137	678
Regulatory return	59	39	49	54	86	81	76	70	64	377
Single till income	(109)	(103)	(88)	(86)	(87)	(86)	(88)	(88)	(87)	(436)
Total determined cost (for CSU basis)	666	695	562	613	661	679	673	672	665	3,351
MOD & exempt flight uplift	7	17	14	8	7	7	7	7	7	36
Total determined cost (for TSU basis)	673	712	576	621	669	686	681	679	671	3,386

Total NERL determined costs

En route determined costs

CY, 2020 prices, £m	2019	2020	2021	2022	2023	2024	2025	2026	2027	NR23 total
	<i>Actual</i>	<i>Actual</i>	<i>Forecast</i>	<i>Forecast</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	
Operating costs										
<i>Staff costs</i>	272	265	231	245	251	260	263	266	271	1,311
<i>Non-staff costs</i>	145	123	118	145	147	152	152	152	148	751
<i>Exceptionals & one offs</i>	3	54	(19)	2	3	3	3	3	3	14
Sub total: operating costs	421	442	330	392	402	415	418	421	422	2,078
Cash pensions										
<i>Cash pensions: defined benefit</i>	66	66	65	64	83	83	81	80	79	406
<i>Cash pensions: defined contribution</i>	10	12	11	13	15	16	18	19	21	89
<i>Cash pensions: PCA</i>	16	16	13	12	12	10	9	8	8	47
Sub total: cash pensions	92	93	89	89	110	109	108	108	107	542
Regulatory depreciation	175	194	159	139	123	132	132	132	131	650
Regulatory return	58	37	47	52	84	79	74	68	62	367
Single till income	(109)	(103)	(87)	(86)	(86)	(86)	(87)	(87)	(87)	(434)
Total determined cost (CSU basis)	637	664	537	587	632	649	644	643	635	3,203
MOD & exempt flight uplift	7	17	14	8	7	7	7	7	7	36
Total determined cost (TSU basis)	644	680	551	594	639	656	651	650	642	3,238

Total UKATS determined costs

Oceanic determined costs

CY, 2020 prices, £m	2019	2020	2021	2022	2023	2024	2025	2026	2027	NR23 total
	<i>Actual</i>	<i>Actual</i>	<i>Forecast</i>	<i>Forecast</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	
Operating costs										
<i>Staff costs</i>	14	13	11	11	12	12	12	13	13	62
<i>Non-staff costs</i>	5	4	3	5	5	5	5	5	5	26
<i>Exceptionals & one offs</i>	0	2	(1)	0	0	0	0	0	0	1
Sub total: operating costs	19	19	14	16	17	17	17	18	18	88
Cash pensions										
<i>Cash pensions: defined benefit</i>	3	3	3	3	4	4	3	3	3	18
<i>Cash pensions: defined contribution</i>	0	1	1	1	1	1	1	1	1	4
<i>Cash pensions: PCA</i>	1	1	1	1	1	1	0	0	0	2
Sub total: cash pensions	4	4	4	4	5	5	5	5	4	24
Regulatory depreciation	4	7	6	6	6	6	5	5	5	28
Regulatory return	2	1	2	1	2	2	2	2	2	10
Single till income	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(2)
Total determined cost	29	31	24	26	30	30	29	30	30	148

Total oceanic determined costs

Explanatory notes and key assumptions

- Values for the depreciation of the regulatory asset base (RAB) and cash pension contributions for the RP3 period (2020-22) reflect the allowances/assumptions made by the CAA with updates for latest inflation
- Determined cost projections for NR23 exclude true-ups relating to under or over recovery of traffic volume variances, inflation variances and incentives. They exclude our best estimate of cost exempt true-ups in relation to cost variances such as pension and radio spectrum costs, which will be reviewed and approved after the end of RP3. These true-ups affect prices only, and do not affect determined costs, or determined unit costs (DUCs)
- Determined cost projections for NR23 include true-ups relating to capital expenditure variances between our latest forecast for RP3, and the value originally assumed by the CAA, recovered within regulatory depreciation, consistent with RAB rules. A comparison of our actual/forecast capital expenditure relative to the RP3 plan is provided in [Appendix H](#)
- The value of the RAB at 1 January 2023 will need to be adjusted retrospectively to reflect actual experience during RP3. This will include differences between the actual capex (when known at the end of RP3) and our latest forecast for RP3, which will be recovered through prices in future reference periods (post NR23), consistent with RAB rules
- For oceanic, the determined costs excludes ADS-B data costs as these do not form part of the core oceanic charge

Evolution of Determined Costs

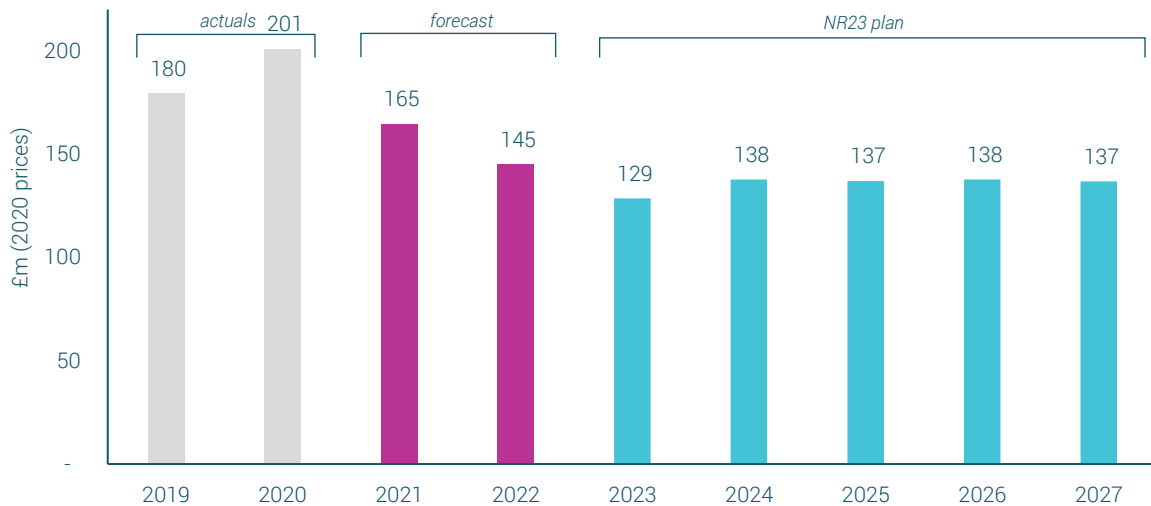
Further information on the evolution of the individual building blocks can be found in the relevant appendices as set out below:

- > Operating costs: [Appendix J](#)
- > Cash pension contributions: [Appendix K](#)
- > Single till income: [Appendix L](#)

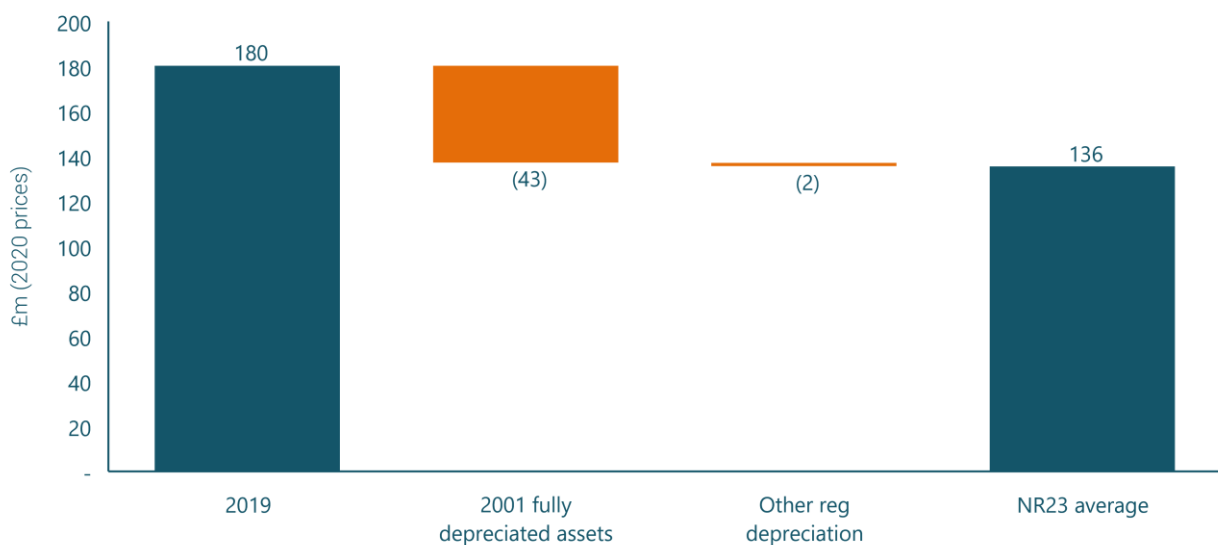
Other building blocks are described below.

Regulatory depreciation

Depreciation of the RAB is driven mainly by depreciation charges relating to capital expenditure made in previous reference periods and, to a much lesser extent, NR23. The opening value of the RAB at the time of the Public Private Partnership transaction is being depreciated over 20 years and will be fully depreciated by 2022. This drives a £44m reduction to average regulatory depreciation vs 2019 shown below.



NERL single till income



NR23 average single till income vs 2019

The profile of depreciation charges is determined by the operation of the standard regulatory principles. Capex additions to the RAB since 2011 are depreciated over 15 years to reflect the average

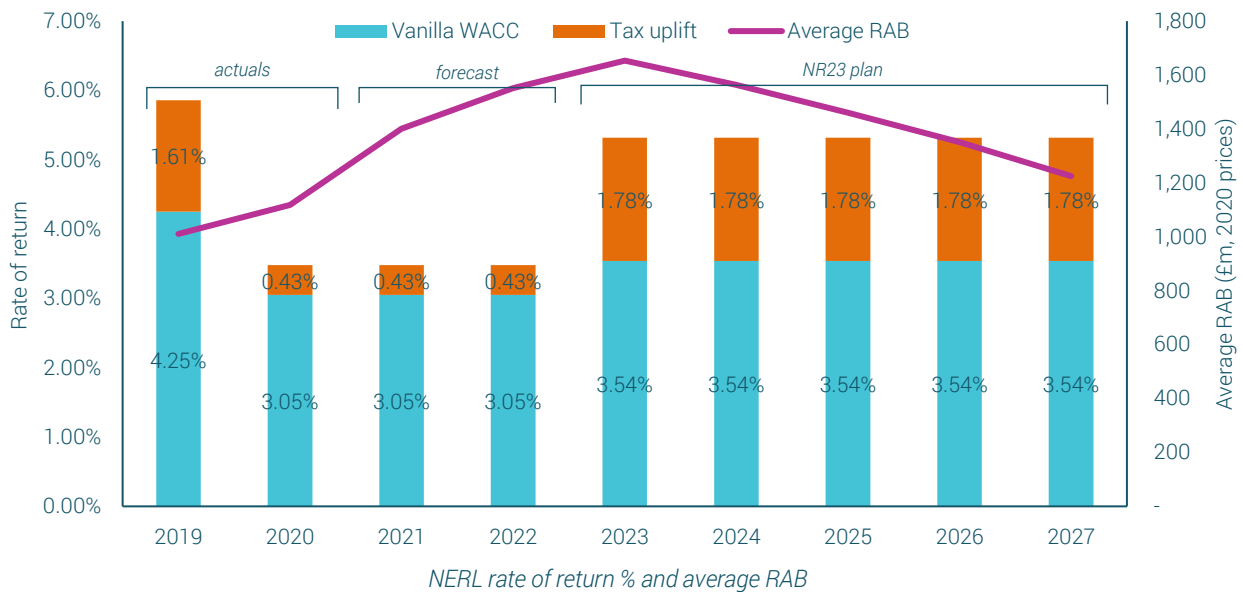
expected useful life of the asset base. As a result, recovery of investments made in NR23 will continue beyond the end of this period.

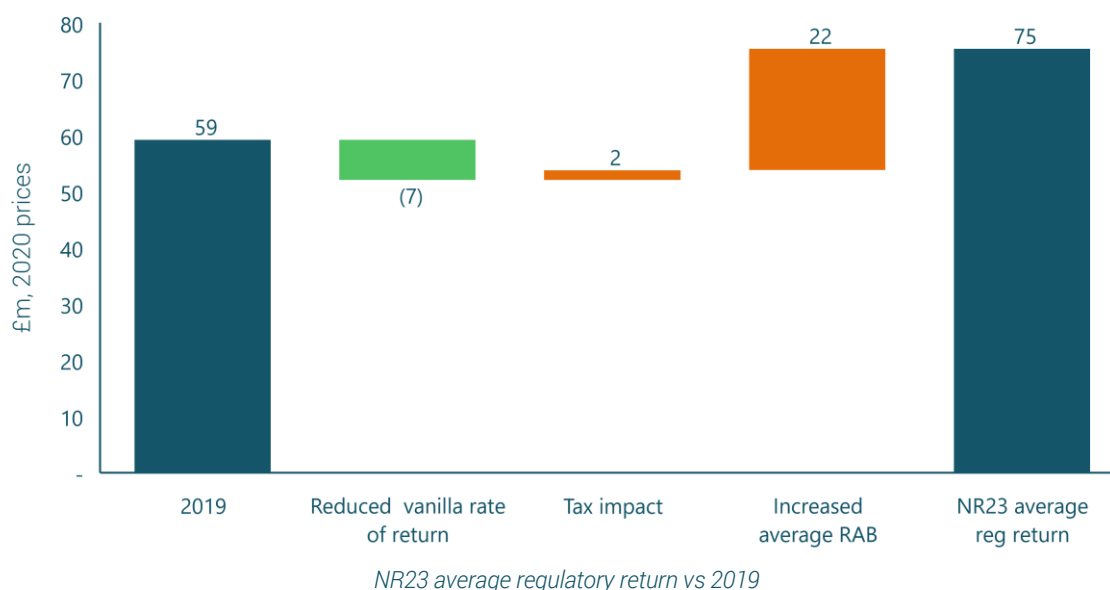
Backlog adjustments are true-ups for differences in depreciation that occur because of changes in the timing and/or value of capital expenditure relative to the price control assumptions. These are lower in NR23 as we slowed the rate of investment in 2020 following a replan of the capital programme in response to the pandemic impact on traffic.

Regulatory return

This is calculated as the product of the calendar year average RAB with the pre-tax Weighted Average Cost of Capital (WACC). Our pre-tax WACC assumption is 5.32% as described in [Appendix M](#).

Our projected RAB is a measure of the amount invested by NERL that is yet to be recovered via regulatory depreciation. It is indexed to RPI because our WACC is set in real (RPI) terms. The RAB includes additions for capital expenditure and reductions for allowed regulatory depreciation, movements in working capital, the pensions pass through asset and capitalised financing costs. The RAB includes the Traffic Risk Sharing (TRS) debtor within working capital. This drives significant growth in the RAB until 2023 to a peak of £1,602m, followed by a year on year reduction as the revenue shortfalls are recovered over time via user charges. The RAB projections are shown below.





NERL projected average RAB	2019	2020	2021	2022	2023	2024	2025	2026	2027
£m (CY, 2020 prices)	Actual	Actual	Forecast	Forecast	NR23 plan	NR23 plan	NR23 plan	NR23 plan	NR23 plan
Underlying RAB	1,031	934	838	854	939	943	939	925	896
TRS debtor	-	195	527	690	663	556	448	341	233
Total average RAB	1,031	1,129	1,364	1,544	1,602	1,498	1,387	1,265	1,129

NR23 average RAB

Our projected regulatory return is £16m (27%) higher than in 2019 due to the higher average RAB and increased tax charges. This is offset by a lower WACC value than in 2019 (3.54% vanilla WACC in NR23 vs 5.86% in 2019). Regulatory return decreases over time in line with reductions to the RAB as the TRS debtor is recovered.

Determined unit costs

Determined unit costs (DUCs) are calculated by dividing our projected costs by projected traffic volumes to establish a unit cost.

By way of clarification, it is important to highlight that unit cost differs from prices, which include true-ups for a number of external costs and variances between forecast and outturn impacts on a number of costs. Prices are described in the later sections of this appendix.

The DUCs presented are based on the STATFOR October 2021 base case forecast.

En route

The en route DUCs are presented below. The average DUC is £52 per service unit, which translates to around £2-3 per passenger per flight². This is around £1 higher than 2019 actuals, reflecting the slightly higher determined costs (described above) and the lower average traffic forecast. It is £1

² Based on an assumption of around 5 service units per flight, and between 80 – 120 passengers per flight.

higher than the Competition and Markets Authority (CMA) determination for RP3, driven by the lower average traffic forecast. On an equivalent traffic forecast to the CMA determination, the DUC would be about £2 lower.

CY, 2020 prices	2019	2020	2021	2022	2023	2024	2025	2026	2027
	<i>Actual</i>	<i>Actual</i>	<i>Forecast</i>	<i>Forecast</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>
En route determined costs (£m)	644	680	551	594	639	656	651	650	642
Traffic (TSUs, '000s)	12,594	5,106	5,399	10,630	11,722	12,235	12,431	12,649	12,858
En route DUC (£)	51	133	102	56	55	54	52	51	50

En route DUC

Note that the 2020, 2021 and 2022 DUC values are based on actual/forecast costs and actual/forecast traffic levels. They do not reflect the DUC charged in the unit rates, which are based on the CMA determination.

London Approach

The projected London Approach DUC is described below. The London Approach cost base reflects around 37% of the total operating costs associated with the London Approach function; this is consistent with the basis applied for RP2 and RP3.

Previous analysis undertaken during RP3 indicated that deriving a London Approach charge using an assumption that classified flights as 'terminal' from 20km through to the point of operational handover to tower resulted in a materially consistent London Approach charge. We have therefore not changed our approach to the derivation of the London Approach cost base and charges.

Further detail on the regulatory framework for London Approach is provided in [Appendix P](#).

CY, 2020 prices	2019	2020	2021	2022	2023	2024	2025	2026	2027
	<i>Actual</i>	<i>Actual</i>	<i>Forecast</i>	<i>Forecast</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>
London Approach Determined Costs (£m)	13	12	9	13	13	13	15	15	15
Traffic (TNSUs, '000s)	989	399	364	821	926	959	974	991	1,007
London Approach DUC (£)	14	29	26	16	14	14	15	15	14

London Approach DUC

Note that the 2020, 2021 and 2022 DUC values are based on actual/forecast costs and actual/forecast traffic levels. They do not reflect the DUC charged in the unit rates, which are based on the CMA determination.

In CAP 2291, the CAA asked us to set out our actual/forecast cost baseline for 2020-22, and explain differences to the CMA determination as part of the process to adjust the Traffic Risk Sharing (TRS) mechanism and reset charges. We therefore understand that the cost reconciliation should apply equally to London Approach. We estimate that this would add around a further £2 pa to the London Approach charge in NR23, assuming that 75% of the TRS debtor is recovered in NR23, with the remaining 25% recovered in NR28.

Oceanic

As described in [Appendix P](#), the total unit cost per flight for the oceanic service comprises the costs incurred by NERL in delivering the core service plus the additional ADS-B data charge per flight. The

core unit costs for NR23 are projected to be 3% higher in real terms than 2019 actuals, driven by the lower annual average traffic over the NR23 period than in 2019, and the increase in NERL's costs for delivering the oceanic service.

The core charges and ADS-B charges for the oceanic service are shown in the table below, excluding price adjusters related to RP3 traffic variances.

CY, 2020 prices	2019	2020	2021	2022	2023	2024	2025	2026	2027
	<i>Actual</i>	<i>Actual</i>	<i>Forecast</i>	<i>Forecast</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>	<i>NR23 plan</i>
Oceanic determined costs (£m)	29	31	24	26	30	30	29	30	30
Oceanic flights ('000s)	505	209	234	386	499	488	498	509	520
Oceanic core unit cost per flight (£)	57	149	104	69	59	61	59	58	57
<i>North Atlantic ADS-B unit cost (£)</i>	-	32	30	31	32	32	30	30	30
<i>Tango ADS-B unit cost (£)</i>	-	0	4	8	6	6	5	5	4
North Atlantic charge per flight (£)	57	181	134	100	91	93	89	88	87
Tango charge per flight (£)	57	149	109	77	65	67	63	63	61

Oceanic DUC

Note that the 2020, 2021 and 2022 charges are based on actual/forecast costs and actual/forecast traffic levels. They do not reflect the actual charges, which are based on the CMA determination.

In CAP 2291, the CAA asked us to set out our actual/forecast cost baseline for 2020-22, and explain differences to the CMA determination as part of the process to adjust the TRS mechanism and reset charges. The extraordinary circumstances caused by Covid-19, which have necessitated a reopening of the NERL plan and modification of the UKATS TRS mechanism have affected all parts of our business, and as such, we are assuming that the cost reconciliation will apply equally to the oceanic business. In addition, the CAA requests costs information on the entirety of our business, and has stated that the reconciliation review applies to NERL as a whole. We estimate that the combined effect of resetting the price control for lower costs and traffic, and applying the TRS debtor process for oceanic would add around a further £13 - £15 pa on average to the core oceanic charge in NR23, assuming that 75% of the oceanic TRS debtor is recovered in NR23, with the remaining 25% recovered in NR28.

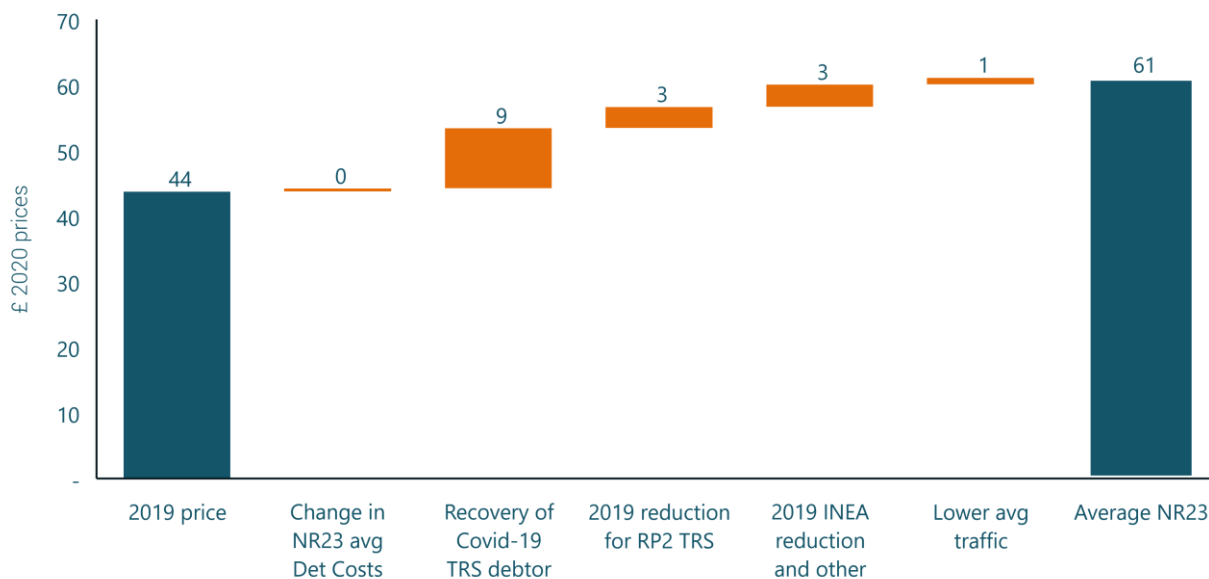
Prices

Prices are based on the DUCs set out above, plus a number of adjustments under the regulatory framework which are described in [Appendix P](#).

Our projected prices for the en route service assume that 75% of the TRS debtor, relating to the recovery of revenue shortfalls in 2020-22, is recovered via charges across NR23, with the remaining 25% recovered in NR28. We have adopted a flat price profile in NR23, following the feedback from the customers through the consultation process which is further described in [Appendix B](#). The constant price has been determined by calculating a price that is net present value neutral when compared to a base case with no price profiling. The rate of recovery of the TRS debtor in NR23 is impacted by the price profiling within NR23, and is therefore slightly back-end weighted. For NR28, the adjustment to prices for the TRS debtor is assumed to be undertaken on a straight line basis.

Average prices in NR23 are around £17 (39%) higher than 2019, mainly due to the recovery of 2020-22 revenue shortfalls through the TRS debtor, and a number of reductions to the 2019 price which are

not repeated in NR23 (mainly European Innovation and Networks Executive Agency (INEA) funding and pass back of RP2 traffic risk sharing revenues).



Average NR23 en route price vs 2019

CY, 2020 prices, £m	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Actual	Actual	Forecast	Forecast	NR23 plan	NR23 plan	NR23 plan	NR23 plan	NR23 plan
En route determined costs (£m)	644	680	551	595	639	656	651	650	642
Price adjusters									
<i>Covid-19 TRS debtor</i>	-	-	-	-	113	114	115	117	118
<i>Traffic risk sharing mechanism</i>	(41)	(53)	(61)	-	-	-	-	-	-
<i>Inflation true up</i>	(16)	(13)	(14)	(7)	(6)	(1)	-	-	-
<i>Costs exempt</i>	2	2	8	8	8	7	4	4	4
<i>INEA & other revenues</i>	(41)	(8)	(13)	(25)	(5)	(3)	(7)	-	-
<i>Others</i>	3	4	14	(39)	(36)	(12)	-	-	-
Sub-total price adjusters	(93)	(68)	(66)	(63)	75	90	106	121	142
Total revenue allowance	551	612	486	531	715	746	758	771	784
Traffic (TSUs, '000s)	12,594	5,106	5,399	10,630	11,722	12,235	12,431	12,649	12,858
Unit rate	44	120	90	50	61	61	61	61	61

NR23 en route prices