Economic Insight

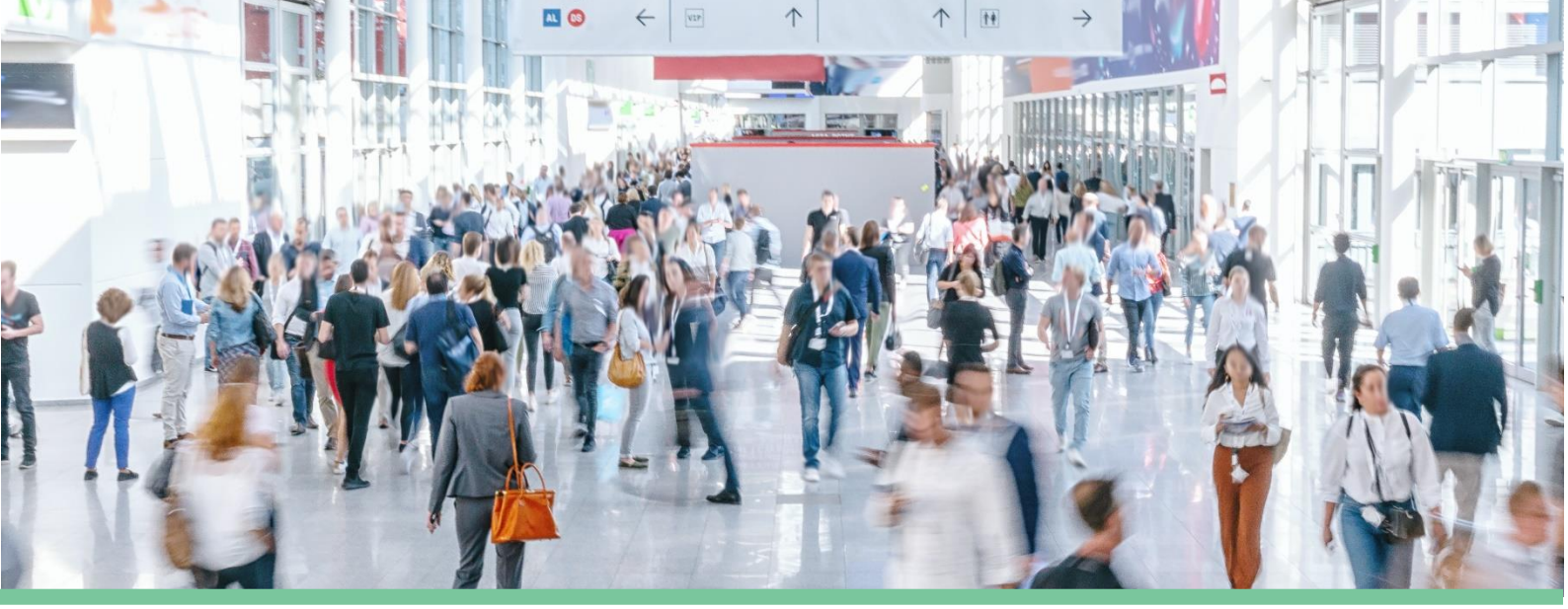
November 2019

Economic Insight Ltd

INDEPENDENT REVIEW OF CAPEX GOVERNANCE

REPORT FOR NATS

CONTENTS



1. Executive summary

This report sets out an independent assessment of the capex governance arrangements proposed by both the CAA and NERL for RP3. Whilst the respective proposals of each party have their strengths and weaknesses, our overall assessment is that the CAA's suggested governance risks creating considerable customer detriment, and performs more poorly against our evaluation framework than NERL's. An assessment of governance should start from the 'problem' it seeks to solve. In our view, this seems to be to achieve a 'slight rebalancing' between the risk of underinvestment (with consequences for service quality) and the risk of allowing inefficient capex (with resultant higher prices in the short term). Both proposals are deficient, in that they do not evidence whether the current balance is appropriate, nor how their approach might achieve a 'better' balance. However, in practice, NERL's proposition seems more grounded in the reality of the sector (and is more consistent with the evolution of governance to date). In contrast, the CAA's proposition seems at odds with industry characteristics, which imply that customers are better protected by placing more weight on avoiding underinvestment / maintaining quality. Indeed, for this reason, there is a tension in the regulator's governance proposals and the philosophy that underpins its approach to capex cost recovery more broadly.

Of further concern, the CAA's three new financial incentives would seem to increase financial risk and represent a material change relative to RP2. Specifically, they allow the regulator to adjust NERL's cash flows for capex already spent 'ex-post'. This is especially troubling, given the challenge in distinguishing between 'the benefit of hindsight' and actual efficiency and performance risk.

The evidence on which our assessment is based is primarily qualitative in nature. As such, there seems to be scope to develop additional evidence to help further inform the CMA's redetermination. Consequently, and to be of assistance, we identify a range of issues that may merit further consideration.

1.1 Introduction and context

The Civil Aviation Authority (CAA) has referred its RP3 Final Decision for NATS En Route plc (NERL) to the Competition and Markets Authority (CMA). To support the CMA in evaluating the proposals put forward by the CAA and NERL in relation to capital expenditure (capex) governance arrangements, NERL asked Economic Insight to undertake this independent review. The purpose of this is to assess the merits of the proposals put forward – and identify key issues that the CMA may wish to consider further, as it takes forward its determination of the RP3 control.

To achieve the above aims, we have developed an evaluation framework; reviewed cross-sector precedents; and assessed the proposals put forward by the CAA and NERL. Our report is structured as follows.

- The rest of this chapter provides an executive summary of our findings.
- Chapter 2 contains our evaluation framework.
- In Chapter 3 we set out a comparative analysis of the characteristics of the air traffic control industry and capex, relative to other regulated industries.
- Chapter 4 provides a summary the CAA's and NERL's proposals - and then sets out our evaluation of them. Here, we draw on our assessment of industry characteristics to inform our assessment.
- Chapter 5 contains our conclusions and recommendations. To be of assistance to the CMA, we identify issues for further consideration during the redetermination.

1.2 Executive summary

1.2.1 Overview of the CAA's and NERL's proposed capex governance arrangements

Historically, NERL's capex has been regulated under a 'cost pass-through with governance' model. This means NERL is able to recover the costs of the capex it actually incurs, subject to governance arrangements and approvals. Reflecting differences in industry characteristics, this varies from industries such as energy and water, where capital costs are subject to 'hard ex-ante allowances' by regulators, which also incorporate an ex-ante efficiency incentive challenge.

At RP3, both NERL and the CAA are proposing changes to 'enhance' and 'strengthen' the capex governance arrangements. There are a great many components to said arrangements and the proposals of the parties are similar in relation to a number of *'process'* elements. However, they differ in two very important respects:

- The CAA proposes an **'enhanced role' for the Independent Reviewer** (IR), which moves their responsibility away from an assessment of the reliability of NERL's reporting (as per the existing licence condition) towards an assessment of its actual and proposed capex performance. NERL does not support this change.
- The CAA proposes three **new financial incentive mechanisms**: a delivery incentive; an (ex-post) efficiency incentive; and an information incentive. NERL does not support these.

THE CAA's AND NERL's CAPEX GOVERNANCE PROPOSALS DIFFER IN TWO IMPORTANT RESPECTS – THE CAA PROPOSES: (A) AN ENHANCED ROLE FOR THE INDEPENDENT REVIEWER; AND (B) THREE NEW INCENTIVE MECHANISMS THAT ALLOW BACKWARD-LOOKING ASSSSESMENTS TO INFORM THE APPLICATION OF EX-POST PENALTIES TO NERL. AS SUCH, THIS REPRESENTS A MATERIAL DEPARTURE FROM RP2.

- The **delivery incentive** allows the CAA to apply financial penalties, via either a reduction in revenue or the RAB (applied at the start of RP4) if NERL does not deliver capex projects / the programme overall, against key predefined milestones.
- The **ex-post efficiency incentive** allows the CAA to 'disallow' capex (already incurred over RP3) at the start of RP4 if it is retrospectively assessed to be 'inefficient'. The form of this penalty would be in the form of a downward adjustment to the RAB at the start of RP4.
- The **information incentive** allows the CAA to remunerate certain capex at the cost of new debt, rather than the WACC, where it considers there to be significant weaknesses in NERL's provision of information. The form of this penalty would be a one-off reduction in revenues or the RAB, at the start of RP4.

The above represents a material departure from RP2 and prior price controls. Most obviously, whilst NERL and the CAA have always considered such matters when developing / appraising Business Plans (i.e. historical information has informed the assessment of new capex on a forward-looking basis) these new incentives allow backward-looking assessments of capex to be used to determine the imposition of financial penalties. Put simply, the CAA is, for the first time, able to adjust NERL's capex related cash flows ex-post (i.e. after the event of the capex being invested by NERL).

1.2.2 Starting from the problem: a framework for considering capex cost recovery and governance

When evaluating the proposals of the CAA and NERL**, it is important to be clear as to the 'problem' one is seeking to solve.** Consequently, we develop a framework to inform how one should determine the appropriate approach to capex cost recovery more broadly – and governance more specifically – in industries subject to economic regulation.

In relation to the overarching approach to capex cost recovery, key considerations are: (a) how best to strike a balance between: cost minimisation; making best use of resources; and driving innovation over time;[1] and (b) the 'likelihood' and 'consequences' of regulators making errors when setting price controls. In regard to the latter, a regulator faces a risk that any capex 'challenge' they set (incorporating both cost and quality dimensions) is 'too easy' (leading to 'too high prices' in the short run) or is 'too hard' (leading to 'too low quality' and underinvestment). The harm to customers of the second error is greater if underinvestment results in innovation being lower in the longer term. Critically, there is no 'universally correct' approach to addressing (a) and (b) above. The appropriate path depends on the characteristics of the industry in question. For example, if in one industry the consequence of underinvestment is very adverse for customers (say, because investments are essential to deliver safety related outcomes) and / or if the downside of inefficient investment is lower, capex cost pass-through might be appropriate. Whereas, in another industry with the opposite features, an ex-ante capex allowance and efficiency challenge would be a better fit (e.g. as per the water and energy industries). Thus, in the real world, a spectrum of models for capex cost recovery can be observed.

[1] *Technical, allocative, and dynamic efficiency.*

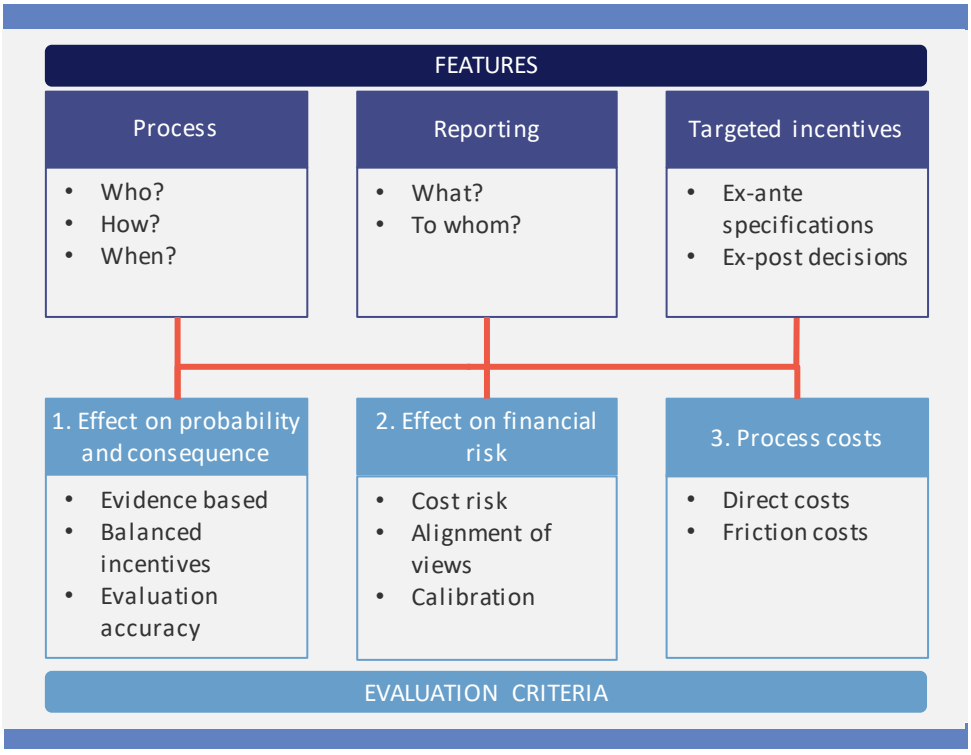
THE 'PROBLEM' THAT GOVERNANCE SEEKS TO SOLVE IS A POTENTIAL DESIRE BY A REGULATOR TO SLIGHTLY 'REBALANCE' THE WEIGHT PLACED ON VARIOUS FORMS OF EFFICIENCY, GIVEN THAT, AT A HIGH LEVEL, THIS CHOICE WILL HAVE ALREADY BEEN MADE IN DETERMINING THE APPROACH TO COST RECOVERY – WHICH, IN TURN, SHOULD REFLECT THE SPECIFIC CHARACTERISTICS OF THE INDUSTRY IN QUESTION.

In the above context, **'governance arrangements'** can be viewed as an alternative means of balancing the differing forms of efficiency and the risks of regulatory errors, once the more fundamental cost recovery model has been chosen. For example, suppose one had determined that, given an industry's features, capex cost pass-through was more suitable than an ex-ante allowance and efficiency challenge (i.e. as is the case for NERL). Put simply, logically one has concluded that the risk of underinvestment is more harmful to customers than the opposite error. However, notwithstanding this, a regulator might wish to *somewhat* rebalance the weight it places on other forms of efficiency (i.e. it might want to place *some* weight on nearer-term cost efficiency. Seen in this way, governance can be thought of as a **process of ongoing engagement** with the regulator and/or other parties that can help achieve this end. Put simply, the 'problem' governance might seek to solve should start from evidence that the prevailing balance is inappropriate; and so its goal should be to deliver a more appropriate balance.

Figure 1 summarises our framework for assessing capex governance proposals. The first criterion relates directly to the above, in that it refers to impact of any governance on the **likelihood and consequence of regulatory errors.** Within this, sub criteria are:

- whether any proposed governance arrangements start form evidence that the prevailing 'balance' is unsuitable;
- whether there is evidence to suggest the new proposed governance arrangements strike a better balance; and
- evaluation accuracy (even if the above criteria were met, governance would only succeed in rebalancing if the assessment of efficiency was accurate).

Figure 1: Framework for evaluating capex governance arrangements



Source: Economic Insight

Our framework also takes account of:

- The impact governance arrangements may have on **financial risk.** For example, if incentives are included, as the CAA proposes, clearly the overall degree of risk, and its allocation between a company and other stakeholders, may be impacted.

- **Process costs.** All governance comes with costs. These may be direct costs, associated with the administration of the process / creation and exchange of information; and 'friction' costs (e.g. the process itself takes time – and ergo may delay efficient investment).

1.2.3 Comparative analysis of industry characteristics

A practical application of our framework can be informed by a comparative assessment of industry characteristics. Here, the key points are as follows:

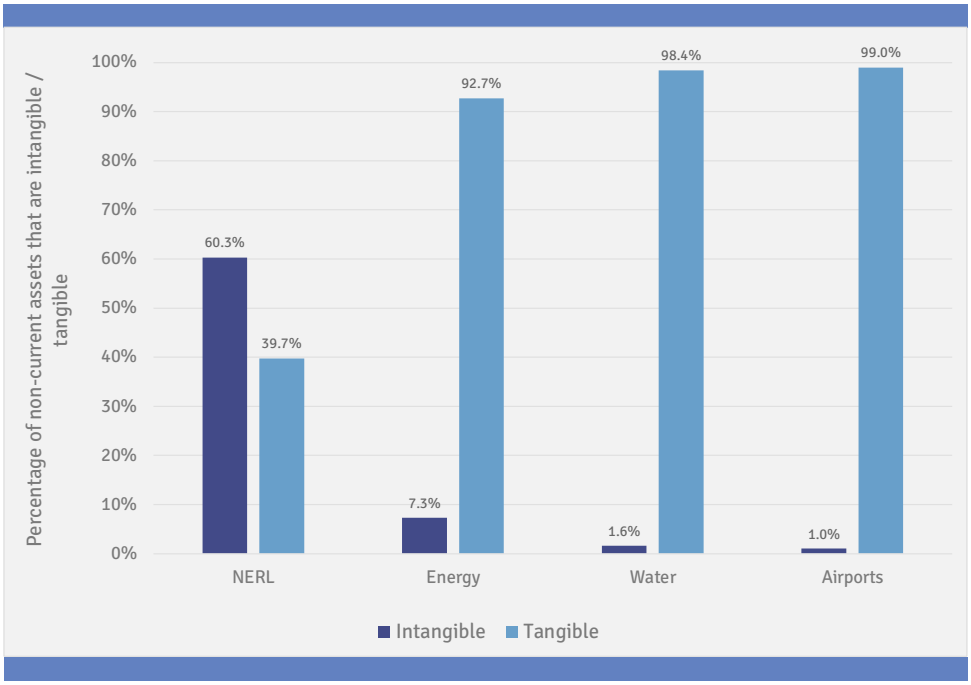
- **In air traffic, safety is pre-eminent.** Ultimately, this means that the consequence of inadvertently preventing efficient investment is likely much higher than the opposite error.

  - This is not to say that NERL would compromise on safety. Indeed, near-term more immediate consequences of underinvestment would be delays and, in a more extreme case, airspace closure if capacity were so constrained.
  - In the end, however, clearly safety is contingent on investment – thus, it is explicitly demarked as pre-eminent in both the CAA's duties and NERL's licence conditions (distinguishing air traffic from most other regulated industries).

- **Air traffic control is relatively capex light.** This means the downside of allowing inefficiently high capex (overinvestment) is lower than in industries where capex accounts for a higher proportion of costs and, therefore, the charges customers ultimately pay.

- **Air traffic control has a high intensity of intangibles (see following figure).** In most regulated industries, the vast majority of capex is in tangible assets (e.g. 'hard' infrastructure), whereas for NERL, intangibles account for most of its investment. This reflects the fact that NERL invests heavily in software and IP. The performance of (and returns on) intangible assets is typically more uncertain than tangible assets. All else equal, this increases ex-ante efficiency risk – but also makes the assessment of efficiency harder, relative to other regulated industries.

Figure 2: Split between intangible and tangible assets



Source: Economic Insight analysis of financial accounts and annual reports

- **Air traffic investment has short asset lives.** This means investments are renewed more frequently than in typical regulated industries. All else equal, this would seem to increase governance process related costs. In addition, the shorter asset lives are consistent with NERL being subject to a higher rate of technological change than in other regulated industries and / or, for any given rate of technological change, the impact of that on costs and outcomes feeding through more quickly. This might imply that it is harder for NERL (or a relevant stakeholder) to determine a long way 'in advance' what investments are most efficient. The shorter asset lives for NERL also further mitigate any potential adverse impact on customers of allowing inefficiently high investment. That is to say, the impact only persists for a period of 15 years, whereas in other industries, such impacts would persist for much longer.

- **NERL's capex is volatile and partly outside of management control.** This further complicates any assessment of efficiency.

Seen together, the characteristics of the air traffic control industry are consistent with the 'cost pass-through' model that applies to NERL's capex. As noted, this is very different to industries such as energy and water, where capex allowances and efficiency challenges are set ex-ante. In addition to explaining 'why' we observe capex cost pass-through in the first place for NERL, these matters can inform a consideration of governance proposals.

'Seen together, the characteristics of the air traffic control industry are consistent with the 'cost pass-through' model that applies to NERL's capex… In addition to explaining 'why' we observe capex cost pass-through in the first place for NERL, these matters can inform a consideration of governance proposals.'

1.2.5 Summary of our evaluation

We would summarise the main findings from our evaluation as follows:

- **The CAA's proposed introduction of three capex incentives represents a material change from previous price control approaches for air traffic control.** Whilst some change may be appropriate, there is a lack of evidence and framework to suggest the new proposals provide a better 'balance' of efficiency considerations than the status quo.

- **Similarly, NERL itself does not seem to have deeply reflected on the existing balance of risk to determine one way or another whether, and to what extent, change is appropriate at RP3.** However, as below, 'in practice' its proposals are a better fit to the industry. Indeed, it seems that NERL has been seeking to make more 'incremental' changes, which appear logical, given that the industry's characteristics have not fundamentally changed.

- **Evidence on the industry's characteristics suggests that avoiding the downside possibility of preventing efficient investment / too low quality should be the primary goal.** For example, the overarching safety consideration, and importance of resilience. However, the CAA's proposals contradict this by placing considerable weight on nearer-term efficiency, such as cost minimisation. Whilst NERL's proposals also place somewhat more weight on these shorter-term considerations relative to RP2, this is to a much lesser degree (i.e. because NERL is not proposing monetary incentive mechanisms). There is, therefore, a tension underlying the CAA's proposals and the broader regulatory framework.

- **The CAA's incentive proposals work on an ex-post basis (notably, efficiency) and incorporate considerable discretion. As such, they would seem to have a non-negligible impact on financial risk.** Here, a critical issue is that the CAA's approach risks conflating the 'benefit of hindsight' with actual efficiency and the risk NERL faced on a forward-looking basis. This is particularly problematic, given the high proportion of NERL's investments that are 'intangible'. In contrast, NERL's proposals do not impact financial risk one way or another. The implications of this do not appear to have been duly considered for the broader price control design (e.g. for the WACC).

- **No governance arrangements are costless.** Whilst we have not quantified the likely processes costs, intuitively these would seem to be greater under the CAA's proposals.

Drawing the above together, Table 1 summarises our evaluation. As can be seen, whilst the governance proposals from the CAA and NERL have their respective strengths and weaknesses, we find the CAA's perform significantly more poorly against our evaluation criteria. Their main weakness, as noted above, is that they place considerable weight on near-term efficiency (cost minimisation in particular) despite features of the industry suggesting that customers are best served by ensuring one avoids preventing efficient investment from proceeding and avoids unduly low quality levels – i.e. amongst other things, following from the overarching safety requirement.

Table 1: Summary of relative evaluation

	CAA	NERL
1. Effect on the probability and consequence of inefficient investment		
1a) Evidence based and targeted		
1b) Appropriate balance of incentives		
1c) Evaluation accuracy		
2. Financial risk		
3. Process costs		

Source: Economic Insight

Our review of the available evidence and proposals of the parties has also given rise to the following observations:

- **The CAA indicated that incentives would be an important aspect of the price control relatively early on in the development of its method for RP3, but was unclear as to whether it expected incentives to form part of capex governance**. At the beginning of the price control process (as part of the CAA's strategic outcomes document), the CAA set out the requirement for incentives – although this was in relation to NERL's Business Plan as a whole, rather than specifically in relation to capex governance. Very specific incentives, as part of capex governance, appear to have first arisen in the CAA's Draft Proposals, and then later in its April 2019 'working note', (where it stated that one of the principles guiding its proposals was that: capex delivery, cost efficiency and information provision should be *financially incentivised).* Therefore, it seems likely that in developing its Plan, NERL's investment proposals were calibrated to an assumed overall balance of risk that is different from the one the CAA now seeks to impose.

- **The CAA's proposals appear to be unfinished**. A key concern raised by the CAA's proposals is that they appear to hand the regulator significant discretion to make ex-post interventions. This is generally against good regulatory practice. Relatedly, however, the CAA's capex governance proposals still appear to be 'draft' (see appendix I of its Final Decision document). Furthermore, the CAA has not specified how incentives will be calculated in practice. For example, it has not been specified how the delivery incentive will be calculated, only that it will be capped at £36m. Nor is there clarity as to how milestones will be determined. This would seem to further contribute to regulatory risk.

- **The CAA has previously considered and rejected financial incentives on capex for NATS**. Specifically, at CP2, the CAA discounted this possibility due to

the fact that: (i) NATS already faced strong opex and performance incentives; and (ii) the capital programme was hard to precisely specify. In relation to the first issue, we note that opex continues to account for most of NERL's costs – so this rationale continues to apply. In relation to the second rationale, the CAA perhaps considers that, by applying an 'ex-post' approach, it can somewhat mitigate this concern. However, the very reasons that make a cost pass-through approach sensible in the first place *in fact* mean an ex-post approach to efficiency is *even more problematic.*

1.2.6 Recommended key issues for further consideration

Whilst we have set out our own assessment of the capex governance arrangements proposed by the CAA and NERL, this is an important topic on which the CMA will have to reach its own views. To be of further assistance, below we therefore summarise our take on the 'key governance issues' that we think might helpfully be considered further, as the CMA progresses its work.

Table 2: Recommended issues for consideration by the CMA

Topic	Our recommended issues for consideration
Approach to evaluating governance arrangements	• Consider the 'problem' governance is seeking to solve in an industry where capex cost pass-through has been deemed appropriate in the first place. • Develop a framework within which the 'balance' between avoiding underinvestment / low quality can be traded-off against other efficiency considerations. • In practice, is there evidence that the current balance is inappropriate, in light of this?
Practical evaluation of the appropriate approach	• Consider evidence on industry characteristics and how this affects outcomes for customers in the event of underinvestment, versus other efficiency considerations. • Consider the likelihood / ability of governance arrangements to accurately assess the efficiency and effectiveness of capex. • Governance arrangements may increase financial risk – is this likely to be systematic? Has the WACC been calibrated accordingly? • Even if the increased regulatory risk is not systematic, given the negative skew to expected equity returns, have other elements of the control been calibrated appropriately, such that the central expectation is that an efficient firm will earn the WACC? • To what extent does the ex-post nature of the assessments and incentives suggested by the CAA matter? How much regulatory discretion and uncertainty is likely to arise? Can the benefit of hindsight problem be resolved, given the nature of NERL's investments? • What might the process costs be under the proposals? • Consider whether new evidence can be developed to inform the 'in practice' evaluation more robustly than has been possible to date.
Other considerations	• Whether the relatively late emergence of CAA imposed incentives accord with best regulatory practice. • Whether and to what extent NERL would have proposed the same plan, had it envisaged such mechanisms being applied.

Source: Economic Insight

2. Framework for evaluating capex cost recovery mechanisms

In order to evaluate the respective proposals of the CAA and NERL as regards capex governance, it is important to be clear as to the 'problem' one is seeking to solve. As such, this chapter sets out a framework that identifies the key issues which, in principle, should determine the appropriate approach to capex cost recovery more broadly – and governance more specifically – in industries subject to economic regulation. Following this, we show that any evaluation of capex governance at RP3 should take into account: (i) its effect on the probability and consequences of inefficient investment decisions; (ii) its effect on financial risk; and (iii) process costs.

The following sections develop an evaluation framework, within which we subsequently assess the capex governance proposals of the CAA and NERL at RP3. The purpose of this is to ensure that any appraisal reflects a careful consideration of the 'problem' that such arrangements seek to solve. Here, it is further important to recognise that capex governance arrangements should not be viewed in isolation. Rather, they are part of a wider regulatory policy design, relating to the overall approach to capex cost recovery. Consequently, the issues pertinent to determining the capex cost recovery approach are themselves highly relevant to the determination of governance arrangements. Accordingly, in the following, we:

- set out a framework for considering capex cost recovery;
- develop evaluation criteria, specifically relating to governance arrangements; and
- summarise the implications of the above for evaluating the proposed approaches over RP3.

2.2 Framework for determining the approach to capex cost recovery

Within this section, we set out our framework for considering capex cost recovery. In turn, we address: how capex cost recovery mechanisms may promote efficiency; the importance of uncertainty to capex cost recovery; the impact of regulatory errors; and finally, a summary of our framework.

2.2.1 Capex cost recovery mechanisms as a means of promoting efficiency

The main objective of capex cost recovery mechanisms in regulated industries is to *promote efficiency*. This means incentivising capital investments that deliver the best combination of cost and 'quality', given customer/stakeholder preferences. In practice, there are three main strands to 'efficiency' that a regulator will typically take into consideration. These include:

- ensuring that capital investment occurs up to the point that the benefits delivered for customers/stakeholders are equal to the costs of achieving them (**allocative efficiency**);
- ensuring that the capital costs incurred in delivering the outcomes or benefits are minimised (**technical efficiency**); and
- ensuring that capital investment delivers improved quality and reduced cost over time, reflecting customers' changing preferences (**dynamic efficiency**).

THERE ARE CLEAR TRADE-OFFS BETWEEN SHORT-TERM COST MINIMISATION AND DYNAMIC EFFICIENCY. AS SUCH, THERE IS NO UNIVERSALLY 'CORRECT' APPROACH TO CAPEX COST RECOVERY ACROSS REGULATED INDUSTRIES. WHAT MATTERS IS APPROPRIATELY BALANCING THESE TRADE-OFFS IN A WAY THAT REFLECTS THE SPECIFIC CHARACTERISTICS OF THE INDUSTRY IN QUESTION.

When considering the above, it is important to further note that: (i) quality is multidimensional; and (ii) the concept of costs and benefits might not just include those borne by customers. On the former, for example, quality should incorporate every aspect of outcomes that are 'valued' (e.g. in air traffic control, that would logically include delays, safety and so on). On the latter, regulators may need to take into account environmental and social costs and benefits, or costs and benefits that spill-over beyond the immediate customers more generally.

Critically, there are trade-offs across the above forms of efficiency. For example, one might focus on maximising technical efficiency, by minimising cost in the short term. However, this might mean that investment is reduced relative to the counterfactual, such that, in the long run, innovation is harmed - resulting in costs being higher than they would otherwise be; and / or quality being lower (i.e. dynamic efficiency is reduced).

This trade-off is well established in the academic literature. For example, Poudineh et al (2014) note that: *"the simultaneous incentives for investment and static cost efficiency can send inconsistent signals to regulated firms. This potentially limits the companies' incentives for investment and innovation".*[2] Empirical studies further confirm the presence of such trade-offs. For example, Coublucq et al (2018) examined alternative access models in the US rail freight industry. They found that, under models that prioritised focusing on short-term cost minimisation: *"investment in network infrastructure decreases by 10% per year, leading to a significant decrease in network quality over time. Under this setting, despite the increase of price competition, the decrease in network quality leads to a fall in consumer welfare".*[3]

[2] *'Dynamic Efficiency and Incentive Regulation: An Application to Electricity Distribution Networks.' Poudineh; Emvalomatis; and Jamasb; Energy Policy Working Group, University of Cambridge (2014).*

[3] *'The Static-Dynamic Efficiency Trade-off in the US Rail Freight Industry: Assessment of an Open Access Policy.' Coublucq; Ivaldi; McCullough; Toulouse School of Economics (2018).*

The CMA itself has recognised the above trade-off in the context of merger control where, particularly in relation to technology-driven industries, the authority has been mindful not to apply an overly 'static' perspective on efficiency. In a 2015 report, the CMA noted: *"arguably this dynamic [efficiency] effect is the most important of all – product and process innovations have the potential to lead to a step-change in costs or quality, or to open up new markets".*[4]

The key point that follows from the above is that there is no universally 'correct' approach to implementing capex cost recovery mechanisms and incentives across all regulated industries. Rather, what matters is that the trade-offs across the differing forms of efficiency are appropriately balanced, to reflect the specific features of the industry in question. Consistent with this, we observe a wide variation in approaches applied across different regulated sectors as regards capex cost recovery (and governance).[5] This, then, is a critical issue to consider when assessing the relative merits of the CAA's and NERL's proposed capex governance arrangements.

2.2.2 Capex cost recovery under uncertainty

In addition to considering the appropriate 'balance' between the above forms of efficiency, when designing a capex cost recovery mechanism, regulators also need to carefully consider the uncertainty inherent in identifying the 'efficient' level and cost of capex. Specifically, whilst the goal of regulation might be to encourage the optimal, or efficient, balance of 'cost' and 'outcomes / quality' (i.e. that which would arise in a competitive market) in practice, it is impossible to know what these are – specifically:

- **measurement error** issues mean determining the marginal benefit to customers of investments is challenging, as is the determination of efficient costs; and
- **changes in technology and customer preferences** can make 'predicting' the efficient levels and costs of investment especially challenging.

Given this inherent uncertainty, it is generally accepted that regulators should not 'precisely' predict the cost and quality levels that companies should deliver, nor 'how' they achieve them. Rather, the spirit of incentive regulation is to 'reveal' the efficient price / quality path over time. Nonetheless, as such regulation generally includes the setting of targets, combined with incentives around achieving them, these uncertainties mean regulators must still balance the risk of setting overall allowances that are 'too hard' (not achievable by an efficient firm) or 'too easy' (below the level achievable by an efficient firm).

To illustrate the above, the left-hand pane of Figure 3 (overleaf) identifies the 'true' efficient position as being Point A. However, due to uncertainty, a regulator runs the risk of setting targets that are, for example, at point B or C. It is worth considering the implications of these possibilities:

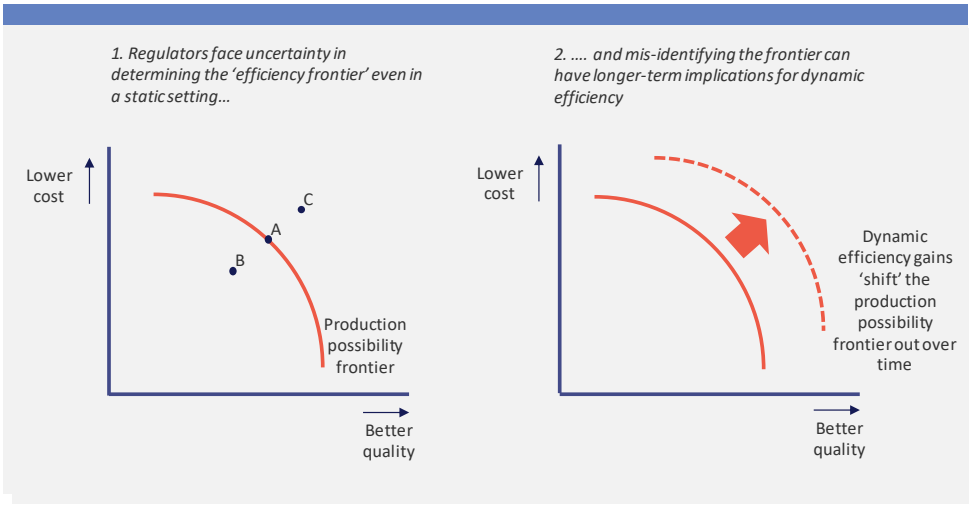
- **Point B would be 'too easy'** – i.e. would imply a challenge that is *below* that which an efficient firm could deliver. As such, this might mean that: customers pay 'too much' for a given level of output / quality (or, vice versa); and / or that there is *over-investment*.

[4] *'Productivity and competition: a summary of the evidence.' The CMA (2015).*
[5] *For examples, see Annex 1.*

- **Point C would be unachievable** – even an efficient company would not be able to deliver these outcomes. In the short run, this might mean that prices are 'too low' to deliver the output / quality customers want (or, vice versa – i.e. customers receive 'too low' quality in the short term). It would also logically imply *under-investment*.

GIVEN THE UNCERTAINTY INHERENT IN IDENTIFYING THE 'EFFICIENT' LEVEL OF CAPEX, REGULATORS RISK SETTING CHALLENGES THAT ARE EITHER 'TOO EASY' OR 'TOO HARD'. THE LATTER HAS KNOCK-ON DETRIMENTAL IMPLICATIONS FOR DYNAMIC EFFICIENCY, DUE TO IT DISCOURAGING EFFICIENT INVESTMENT.

Figure 3: Production possibility frontier



Source: Economic Insight

Clearly, either 'error' (i.e. Point B or C) leads to customer detriment. From an economics perspective, and as reflected by the existence of financeability duties, there is a point of view that, given this uncertainty, setting an *'unachievable'* efficiency point is *'worse'* than setting targets that are *'too easy'*. This is because the former error may lead to more persistent customer harm over the long term, due to efficient (and therefore net beneficial) investment, not occurring.

Specifically, and as illustrated in the right hand pane of the above figure, if investment is below its efficient level, dynamic efficiency (whereby the 'frontier' of the achievable cost / quality combination a firm can deliver 'shifts out' over time) is harmed. Thus, the presence of uncertainty is also highly pertinent to the trade-offs between differing forms of efficiency, as previously discussed.

2.2.3 The impact of errors when determining capex cost recovery

Following from the above, when determining how best to strike a balance in the context of uncertainty, a regulator needs to come to a view as to the impact of any 'errors' it makes in setting or encouraging the efficient level of (capex) cost and quality. This turns on: (i) the **probability** of making said error; and (ii) the **consequence** of the error (primarily, for customers).

2.2.3.1 Probability of errors

In practice, the **probability** of a regulator misidentifying the efficient level and cost of capex will depend on a number of factors. Briefly, these are:

- **Availability of information**. A regulator is likely to need a certain amount of information from the regulated company and other sources, in order to form a

robust view of efficiency. Thus, the chances of accurately determining the efficient cost and level of capex are greater where there is 'more' relevant information available.

- **Robustness of information**. Related to the above, a regulator will also be more likely to set accurate targets the more robust the information available to it.

- **Speed of change in efficient costs**. Uncertainty in what the future efficient position is will increase with the speed at which input (capex) costs change. For example, if construction costs are highly volatile, a regulator will be less able to robustly specify efficient levels.

- **Speed of change in preferences**. Similar to above, if customer preferences are likely to change significantly over time, a regulator will find it harder to robustly identify / incentivise efficient levels of outcomes / quality arising from capex.

- **Ease of specifying quality**. Quality may be inherently difficult to specify, due to it being somewhat 'subjective' (e.g. in the eye of the beholder), or based on very low probability events that occur infrequently. In addition, and as noted elsewhere, quality is multidimensional. Thus, collectively, the 'ease' of being able to specify quality will also likely impact a regulator's ability to encourage efficient capex costs and outcomes.

Clearly, all of the above could vary significantly from one industry to another. For example, the availability and robustness of evidence may generally be greater in industries for which there are a number of 'comparable' firms, relative to industries in which there is a single regulated firm. Hence, the probability of a regulator making an 'error' in specifying or incentivising capex will also vary greatly industry-to-industry.

2.2.3.2 Consequence of errors

The **consequence** of not delivering or encouraging the efficient level, in terms of both capex cost and outcomes / quality, will also depend on a number of industry-specific considerations. These are as follows.

- **The likely impact on customers of quality being inefficiently low in the short term.** Under the possibility of a regulator setting a capex cost / outcome target that is '*too hard*', as noted above, this may result in quality being below the efficient level in the short-term.[6] The extent to which this matters clearly depends on the implications for customers and the associated welfare impact. For example, in the water or energy sectors, this might mean outcomes such as dissatisfaction from poor water quality, increased risk of sewer flooding, or increased risk of power outages. In the air traffic control industry, this could translate to reduced airspace capacity that leads to delays (on the assumption that safety is a 'given' – in the near term – which we expand on subsequently).

- **The impact of quality being inefficiently low in the longer-term.** This is an extension of the above. If the cost / quality parameters are set such that they are unachievable, firms may underinvest, leading to persistently lower quality over time (i.e. the impact of the initial 'error' cannot be quickly remedied, and so the

[6] *i.e. given the price paid by customers.*

adverse consequences become larger). Again, therefore, the nature of the impact will likely vary significantly industry-to-industry because the 'welfare' associated with said outcomes can vary enormously. Therefore, the 'extent' of customer harm will similarly vary across regulated industries. In the air traffic control industry, ultimately there is no escaping the longer-term connection between safety and investment.

As regards the possibility of a regulatory error in the opposite direction (e.g. prices being 'too high' in the short run), clearly this is also important. However, in general it is less relevant to determining the design of capex cost recovery mechanisms in regulated industries, primarily because the impact of the error (i.e. the customer harm) may be less likely to persist over time. For example, if prices are 'too high' for the duration of a price control, a regulator should be able to correct that at the subsequent control, with no lasting harm. Thus, variations in the features of industries are perhaps less relevant.

Drawing the above together, we therefore consider that **the consequence of short-term inefficiently low quality** (and its longer-term implications – i.e. **underinvestment and persistently low quality**) to be of critical importance to the appropriate design of capex cost recovery mechanisms. In simple terms, when considering the uncertainty in regulatory incentive setting and the possibility of setting capex costs / quality targets that are 'too hard' or 'too easy', avoiding the former error is more important in industries where the consequences of 'inefficiently low quality' and 'underinvestment' are greater (and vice versa).

2.2.4 Our framework for capex cost recovery mechanisms

Re-capping on the preceding sections, regulators typically should not prescribe or interfere with specific investment choices. They are, however, nonetheless concerned with the efficiency of capex. Thus, when determining their approach to 'capex cost recovery', regulators may include explicit 'cost efficiency' target setting – meaning that there are ex-ante targets or allowances for efficient spend (including the capex element) with financial incentives to 'beat' the quality and/or cost targets. Under this approach, therefore, information is revealed over time about the efficient combination of cost and quality. However, as we noted, incentive regulation is nonetheless subject to short-run 'errors' (which may have long-term implications). Hence, in relation to capex, where regulators set targets or allowances, with incentives around them, there remains a risk that the overall package is either 'too easy', or 'too hard'.

Given the above, instead of setting ex-ante targets relating to capex, a regulator might alternatively adopt an approach whereby it *allows* the regulated company *to recover the capex costs that it actually incurs*, subject to a degree of governance in relation to what investments are made. That is, instead of financially incentivising the company to make efficient investments, there is a continuing monitoring and stakeholder engagement process to guard against inefficient investments.

In practice, there is a broad spectrum of potential capex cost recovery mechanisms that lie between *pure* **'ex-ante targets / allowances with incentives'** and **'cost pass through with governance'.** Where the ideal approach lies is a function of the probability and consequence of errors occurring under them, as per our framework. Most obviously:

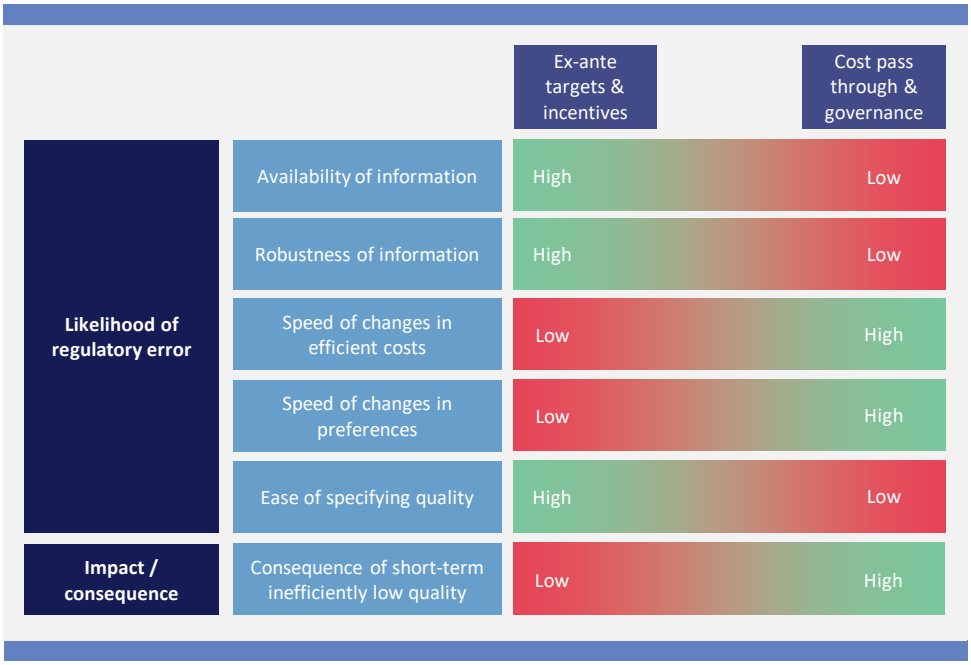
- **Ex-ante targets with incentives** is likely to be more appropriate where there is: high availability of information; high robustness of information; low speed of change of costs and preferences; high ease of specifying quality; and low consequence of short-term inefficiently low quality.

- On the other hand, **cost pass through with governance** is likely to be more appropriate where there is: low availability of information; low robustness of information; high speed of change of costs and preferences; low ease of specifying quality; and high consequence of short-term inefficiently low quality.

Accordingly, Figure 4 sets out our framework for considering the appropriate approach to capex cost recovery. Again, from this it is clear that the most suitable approach is likely to depend heavily on industry-specific characteristics.

THE CONSEQUENCES OF 'INEFFICIENTLY LOW QUALITY' (AND UNDERINVESTMENT) DRIVE THE CHOICE BETWEEN USING 'EX-ANTE TARGETS' OR 'COST PASS THROUGH WITH GOVERNANCE'. IN TURN, THIS DEPENDS ON INDUSTRY SPECIFIC CHARACTERISTICS – WHICH EXPLAINS WHY THE APPROACH FOR NERL DIFFERS FROM THE ENERGY AND WATER SECTORS IN THE FIRST PLACE.

Figure 4: Framework for choosing overarching capex cost recovery approach



Source: Economic Insight

The consequence of short-term inefficiently low quality appears to be particularly relevant to the choice between these two ends of the spectrum. Specifically, if a regulator places a high importance on avoiding inefficiently low quality levels in the short-term (i.e. underinvestment), then allowing the company to recover the costs that it incurs - and monitoring what investments are undertaken - is likely to be the best approach. On the other hand, where the adverse consequences of 'low quality' and 'underinvestment' are lower, a regulator may place more weight on incentives to minimise costs – thus, pointing to ex-ante capex allowances or targets.

When one considers the characteristics of air traffic control, it is clear why, logically, **this distinction lies at the heart of why, for NERL, ex-ante capex allowances have not historically been set - and why (unlike energy and water) it is instead subject to 'capex cost pass-through with governance'.**

2.4 Developing evaluation criteria for governance arrangements

2.4.1 The 'problem' governance seeks to solve

Following from the above, suppose one determines that the features of an industry imply that ex-ante capex allowances / targets with incentive are inappropriate; and, instead, capex cost pass-through with governance should be applied (as is the case for NERL). The next question that logically arises is 'what' an appropriate set of governance arrangements should look like.

Accordingly, to address this – and so enable a transparent evaluation of the relative merits of the CAA's and NERL's proposals for RP3 – it is important to consider 'what' governance arrangements are intended to achieve; 'how' they might do this; and so, their respective pros and cons. Put simply, again **one needs to be clear as to the problem that is being addressed.**

We start from the observation that, if the overarching approach of cost pass through with governance has been chosen, it is likely that ex-ante targets with strong cost minimisation incentives are already deemed not appropriate. Logically, this should likely reflect the factors identified in the preceding sections– but, in particular, most likely means that the consequence of a short-term inefficiently low quality (and underinvestment) is 'high'. Put another way, to have arrived at a 'cost pass-through' approach in the first place, it likely means that one wishes to avoid the possibility of efficient investment not occurring (as this could have significant adverse consequences for customers) – and so this is prioritised.

THE 'IN PRINCIPLE' PROBLEM GOVERNANCE SEEKS TO ADDRESS IS A CONCERN THAT, NOTWITHSTANDING THE OVERARCHING CONCLUSIONS THAT AVOIDING UNDERINVESTMENT / TOO LOW QUALITY IS THE PRIMARY GOAL, A REGULATOR STILL WISHES TO SOMEWHAT REBALANCE THE WEIGHT IT PLACES ON OTHER FORMS OF EFFICIENCY.

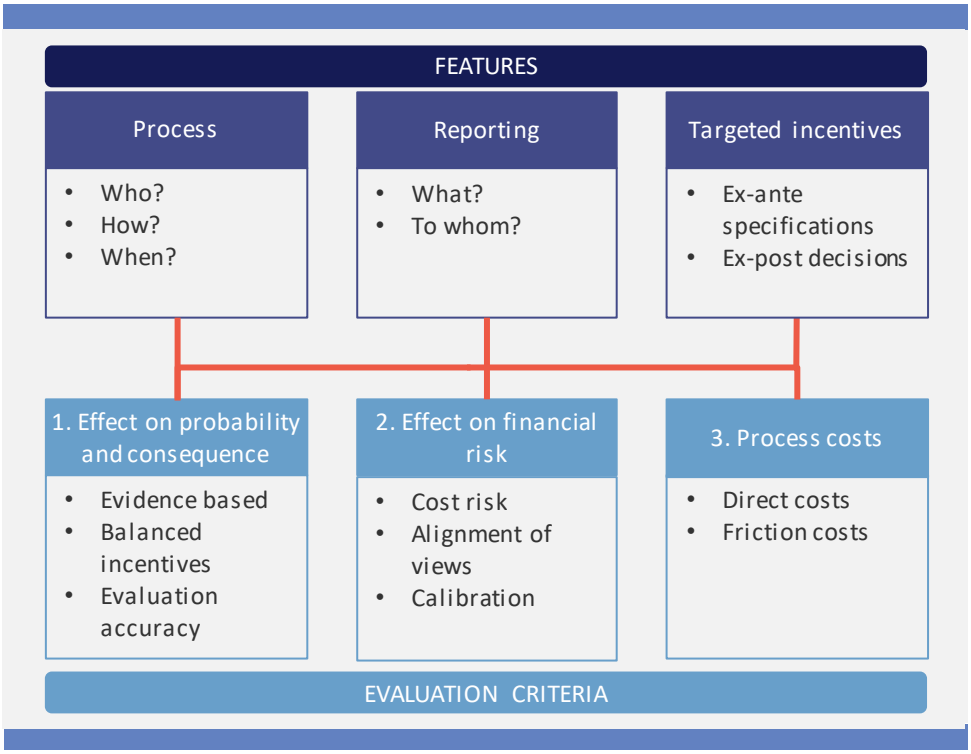
Nevertheless, whilst logically cost pass-through and governance implies that direct ex-ante incentivisation of capex efficiency is inappropriate, a regulator may still be *somewhat* concerned with this (both in terms of cost minimisation and quality). As such, governance arrangements are designed to promote efficiency through **a process of ongoing engagement** with the regulator and/or other parties (as opposed to ex-ante approaches that seek to directly incentivise it). Whilst governance arrangements primarily consist of 'processes' that seek to 'encourage' efficiency, they can sometimes also include 'targeted incentives'. That is to say, incentive mechanisms that are narrowly scoped to help encourage efficiency, but which fall short of an over-arching ex-ante capex efficiency challenge.

In summary, the in principle 'problem' governance seeks to address is a concern that, notwithstanding a regulator has concluded that underinvestment / too low quality is its primary concern (sufficient to rule out strong ex-ante cost minimisation incentives), it still wishes to *somewhat rebalance* the weight it places on other forms of efficiency (i.e. It might want to place *some* weight on nearer-term cost efficiency).

2.4.3 Overview of our evaluation criteria for capex governance

Figure 5 summarises our framework for assessing capex governance arrangements. The framework distinguishes between: (a) the main **features** of governance arrangements (including 'process'; 'reporting'; and 'targeted incentive' components); and (b) the **evaluation criteria** (the extent to which any arrangements impact the 'likelihood' and 'consequences' for customers of capex price / quality being inefficient; the impact of the arrangements on financial risk; and process costs). In the passages below we expand further on our framework.

Figure 5: Framework for evaluating capex governance arrangements



Source: Economic Insight

2.4.4 Features of capex governance

2.4.4.1 Process

The process aspect includes all elements of how the regulated company engages with other stakeholders, as part of the governance arrangements. This includes:

- *who* is engaged with (e.g. the regulator, independent evaluators, customers, other stakeholders etc);
- *how* the engagement occurs – e.g. whether it is through meetings, challenge groups, the ability to review data and information; and
- *how often* the engagement occurs (e.g. annually, or only for major projects).

The above specifications should be guided by the particular concerns that the governance is designed to address. For example, if the objective of the governance is to address concerns about allocative efficiency, it is likely that *customers* will need to be engaged (i.e. this should help better align the 'investments made' with the 'preferences of customers'). Alternatively, if there is a concern about technical

efficiency, the engagement process may need to involve the regulator, or an independent *expert* (i.e. because an analysis of efficiency would be required).

Furthermore, the process should be designed such that only information that is required is shared. As discussed subsequently, the process itself may be costly - and therefore, it should be proportionate in its scope.

2.4.4.2 Reporting

Reporting is necessary in order to facilitate the sharing of information needed for relevant stakeholders to 'engage' in the processes (above). In broad terms, the scope of reporting needs to include: (i) information that allows relevant stakeholders to reach a view as to what the 'correct' or benchmark levels of performance should be for a capital programme / project; (ii) information that allows said stakeholders to monitor actual performance in light of the preceding; and (iii) information that allows stakeholders to make reasoned decisions as to which investment should, therefore, be progressed etc.

2.4.4.3 Targeted incentives

As above, governance arrangements with cost pass through generally apply because an overarching 'efficiency incentive' for capex has been rejected. However, in theory, one could consider hybrid arrangements, where more 'targeted' capex incentives are combined with governance arrangements (indeed, as we subsequently outline, this is what the CAA is proposing for RP3). By targeted incentives we mean any financial incentive mechanisms that are built into the governance arrangements themselves. They cover incentive mechanisms that are specified in advance and applied 'mechanically' (e.g. delivery targets) and incentives that allow the regulator to make ex-post decisions about capex that has been incurred.

2.4.5 Evaluation criteria

As previously summarised, our proposed evaluation criteria are: (i) the extent to which any arrangements impact the 'likelihood' and (adverse) 'consequences' for customers of capex price / quality being inefficient; (ii) the impact of the arrangements on financial risk; and (iii) process costs. Below we briefly expand on these dimensions.

AS CAPEX GOVERNANCE IS INTENDED TO 'REBALANCE' THE WEIGHT PLACED ON DIFFERENT FORMS OF EFFICIENCY, ANY CHANGE MUST BE BASED ON EVIDENCE THAT: THE CURRENT BALANCE IS 'WRONG'; AND THAT THE NEW ARRANGEMENTS STRIKE A MORE APPROPRIATE BALANCE.

2.4.5.1 The impact of arrangements on the probability and consequence of capex being inefficient

This criterion is closely linked to our previous description of how one should determine the appropriate approach to capex cost recovery more broadly. Hence, at its heart is the balance between the risk of the governance approach: (i) resulting in prices that are 'too high' in the near term / overinvestment; versus (ii) resulting in quality that is 'too low', and underinvestment. Noting that the starting presumption is that, to have arrived at a capex cost pass through approach in the first place, one must logically have concluded the second error is more problematic. So, 'governance' is being used because one nonetheless believes that 'some' weight should be placed on nearer term efficiency. With this in mind, we consider the relevant sub-criteria to include the following:

- **Evidence-based and targeted**. Given that the logical objective of governance is to 'encourage' a rebalancing of efficiency considerations, we would expect a robust and well-considered set of governance proposals to start from a clearly articulated and evidenced description of the 'inefficiency' that needs to be rebalanced. For example:

  - Firstly, evidence of 'too high costs' (technical inefficiency) and / or 'investments not reflecting customer priorities' (allocative inefficiency) in the near term.
  - Secondly, evidence that the 'downside' of this is sufficiently large to justify a rebalancing (i.e. that this downside is not being offset by other benefits for customers that arise from cost pass-through).

- **Well-balanced incentive properties.** Following from the above, precisely because governance arrangements should, in principle, be designed to create *some* rebalancing between different forms of efficiency, it is important to assess their incentive properties in practice – so as to determine whether a more appropriate balance is, in fact, likely to be struck. For example, if the arrangements result in 'some' more weight being placed on cost minimisation in the near term, one would need to appraise the likely offsetting downside of greater potential for underinvestment (efficient investment not proceeding). This assessment fundamentally turns on the characteristics of the industry in question. If the arrangements create a balance more appropriate to the industry, they are likely to be *net beneficial.* If the opposite is true, then they are likely to be *net harmful* to customers. Here, it is important to note that, as governance arrangements are just part of a broader approach to capex cost recovery, a helpful presumption is that changes that materially impact the balance of incentives are more likely to be detrimental. That is because, if one assumes the overall cost recovery method (e.g. ex-ante allowance, versus capex cost pass-through) has been correctly determined in the first place, governance should really only 'tweak' and 'slightly adjust' the balance within that context.

- **Evaluation accuracy**. Related to the above, 'even if' governance arrangements are appropriately scoped and designed, so that they might appropriately balance various efficiency considerations, in practice their effectiveness will turn on 'how accurately' said assessment of efficiency is. For example, if the assessment is inaccurate, then the decisions that follow from it may well harm customers (e.g. inefficient investments may be waved through, whereas efficient ones may be rejected) – in which case the desired 'rebalancing' is not achieved. Thus, one needs to consider the likely 'accuracy' of assessments of capex arising from any proposed governance arrangements.

2.4.5.3 Criteria: effect on financial risk

Governance arrangements have the potential to affect the extent of financial risk that a regulated company faces. For example, one effect of a significant change in the regulatory regime may be an increase in the uncertainty of returns – although there may also be offsetting factors. As another example, the ability of the regulator to retrospectively disallow an investment will result in a greater extent of **cost risk** than the company would otherwise face. The effect of greater financial risk may be an increase in the required cost of capital, if the greater risk is systematic i.e. not diversifiable.

The extent of cost risk that the company faces will depend on a number of factors, such as: the expected **alignment** (or misalignment) of views on efficiency between the company and the regulator; the extent of the investment programme that can be retrospectively disallowed; and, relatedly, whether investments would be disallowed in their entirety or, for example, at a reduced rate of return.

In considering any misalignment between the company's and regulator's view of efficiency, it is relevant to consider the information available to each party at the time at which they make their decisions. For example, an investment may be efficient given the information at the time, but on an 'actual' basis turn out to be inefficient (e.g. due to uncertainties beyond management control). Hence, there is a clear potential for a mismatch between ex-post evaluations and the underlying risk faced by a company.

Furthermore, the risk arising from governance arrangements should be **calibrated** with the rest of the price control framework. That is, there should be internal consistency between the WACC that is set and the risk that the company faces.

2.4.5.4 Process costs

Aside from the potential benefits of sharing information, there may be certain 'process' costs arising from capex governance arrangements. Specifically:

- **'Direct' costs,** such as developing information packs, attending meetings, engaging with the regulator etc. This takes up management time and resource.
- **'Friction' costs** – e.g. seeking approval from the regulator can be time consuming and delay investments. This can be costly because customers would not receive the benefit until later.

2.5 Key implications for assessing the proposed governance arrangements

Drawing the content of this chapter together, the key implications are as follows:

- Firstly, it is important that any governance arrangements are **rooted in a clearly identified 'problem'** that they are seeking to solve.
- Secondly, **the 'in principle' problem should be a rebalancing of the promotion of various forms of economic efficiency** – noting that in an industry subject to cost pass-through, it is most likely that one has already 'prioritised' the need to avoid underinvestment – so, this rebalancing is a matter of degree.
- Thirdly, **'in practice' any material change in proposed governance arrangements should be supported by a robust evaluation of its likely impact** (taking into account the full range of costs and benefits). Critically, this needs to include demonstrating that the 'rebalancing' proposed is appropriate. In practical terms, this means taking into account the fact that such arrangements may contribute to reduced quality and underinvestment. This is essential, in order to ensure that any potential 'benefits' arising from promoting other forms of efficiency via governance (e.g. near term cost minimisation) are viewed and appraised in the correct context.
- Fourthly, and finally, we highlight that there is no 'universally correct' balance that should be struck across all regulated industries. **The appropriate balance / prioritisation depends a great deal on the specific circumstances and characteristics in question**. Hence, an in practice application of an evaluation framework can be helpfully informed by an analysis of the industry's characteristics. We therefore address this in the following chapter.

3. Relevant industry characteristics

The application of the framework set out in the previous chapter can be informed by a careful analysis of relevant industry characteristics. We find that, in the air traffic control industry, the pre-eminence of safety, combined with low capex intensity and short assets lives, means that the adverse consequences for customers of under investment ('too low' quality) are likely much more material than the opposite mistake (i.e. over investment / 'too high' prices in the short run). In addition, the 'process costs' associated with governance may, in principle, be relatively high for NERL, given the greater frequency with which investment decisions are made. Finally, the features of NERL's capex (e.g. highly intangible focused) means it is especially hard to predict the effectiveness and efficiency of investments in advance (indeed, we note that 'uncertainty' as to NERL's capex on a forward-looking basis is precisely why the CAA has previously determined not to introduce financial incentives around capex cost recovery). This raises the possibility that ex-post assessments of capex may not accurately reflect the ex-ante risk faced. It also implies that the effectiveness of any capex governance arrangements will be highly contingent on the expertise and experience of the stakeholders and individuals involved.

In the following, we set out the regulatory duties that apply to the CAA relevant to determining the appropriate approach to capex cost recovery and governance - and how these compare to other regulators' duties. We then set out a comparative analysis of the characteristics of NERL's capex. In turn, this includes examining: (i) capex intensity; (ii) intangible intensity; (iii) asset lives; (iv) the volatility and controllability of capex; and (v) the rate of technological change and predictability of capex.

3.1 Regulatory duties relevant to capex cost recovery

Safety is paramount for NERL. Whereas, in other sectors, safety may also be an important consideration, it features less prominently within the relevant statutory duties of the economic regulators. More specifically:

- Within the Transport Act (2000), the CAA's first general duty in relation to air traffic 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 [all other] subsections" [emphasis added].[7] The Transport Act further gives the CAA duties with respect to: customers; promoting efficiency and economy; financeability; international obligations; and the environment.[8] However, these duties are clearly demarked as being subservient to the CAA's overriding duty to ensure the provision of safety.

- Section 8 of the Transport Act further sets out the duties of licence holders (i.e. NERL). This stipulates that any licence holder must: *"secure that a safe system for the provision of authorised air traffic services in respect of a licensed area is provided, developed and maintained"*.[9] Section 8 also gives licence holders obligations relating to taking 'reasonable steps' as regards: efficiency; ensuring current demand is met; and ensuring future demand is met.

THE PRE-EMINENCE OF SAFETY IN THE CAA's DUTIES IS A CRITICAL FEATURE OF THE REGULATORY PRIORITIES FOR NERL, WHICH DISTINGUISHES IT FROM MOST OTHER REGULATED INDUSTRIES.

In contrast, whilst the statutory duties of economic regulators in other industries incorporate safety (either directly or indirectly) with the exception of the ORR, it is not pre-eminent.

- The Water Industry Act (1991) sets out Ofwat's primary duties, including: (i) furthering the consumer objective (where possible by promoting competition); (ii) ensuring water companies can carry out statutory functions; (iii) a financeability duty; and (iv) a resilience duty.[10] Consequently, the economic regulator has no explicit 'safety' related duty. Separate to Ofwat, however, the Drinking Water Inspectorate (DWI) is responsible for ensuring 'health based standards' of water, as derived from European Law.

- In the energy sector, Ofgem's (or more precisely, GEMA's) duties are variously outlined in the: Gas Act (1986); Electricity Act (1989); Utilities Act (2000); Competition Act (1998); Enterprise Act (2002); and Energy Acts (2004, 2008, 2010 and 2011). The regulator's principal objective is to: *"protect the interests of existing and future consumers"*.[11] In fulfilling this objective, the regulator must further have regard to: (i) ensuring reasonable demand for gas / electricity is met; (ii) that licence holders are able to finance their activities; and (iii) the need to contribute to sustainable development. Whilst there is no specific 'safety duty', Ofgem interprets its duty to protect customers, in part, to also incorporate safety.

- In telecoms, the principal duties of Ofcom are to further the interests of citizens in relation to communication matters; and to further the interests of consumers in relevant markets, where appropriate by promoting competition. In fulfilling these duties, Ofcom must always have regard to: (i) the principles that regulation should be: transparent, accountable, proportionate, consistent; and (ii) regulatory best practice.[12] As per Ofwat and Ofgem, there is no explicit 'safety duty' for the regulator. However, the Act permits the Secretary of State to give directions to Ofcom in relation to safety and public health. Further, as per Ofgem, Ofcom may interpret its consumer duty such that it incorporates safety.

7 *'Transport Act 2000' UK Government (2000); Section 2, General Duty (1).*
8 *'Transport Act 2000' UK Government (2000); Section 2, General Duty (2); subsections a to e.*
9 *'Transport Act 2000' UK Government (2000); Section 8, Duty (1), part a.*
10 *'The Water Industry Act 1991.' (as amended, 2014); Section 2.*
11 *'The Gas Act 1986.' Section 4AA (as amended by the Energy Act 2010).*
12 *'The Communications Act 2003.' Section 3.*

- In relation to rail, the Railways Act sets the ORR the following general duties: (a) promoting improvements in railway service performance; (b) protecting the interests of railway users; (c) promoting the use of the railway network; (d) contributing to developing an integrated transport system; (e) contributing to sustainable development; (f) promoting efficiency and economy; (g) promoting competition; and (h) enabling the providers of railway services to plan the future of their businesses with a reasonable degree of assurance. In addition, however, the ORR is required to: *"take into account the need to protect all persons from dangers arising from the operation of railways".*[13] Moreover, separate from its role as an economic regulator, the ORR is also the 'safety authority/ regulator' with respect to railways in the UK. Hence, in addition to its duties relevant to economic regulation, the ORR does have a number of further safety duties – including duties relating to the maintaining of health and safety.

Looking across the duties and roles of the various regulators, the pre-eminence of safety in relation to NERL is notable in the context of considering approaches to capex cost recovery (with only the ORR having somewhat similar obligations to the CAA). For clarity, we are obviously not suggesting that other regulators would act in a manner that would compromise safety. Rather, we think the distinction is that, in relation to air traffic:

- there is a conscious decision to prioritise safety over all other (economic regulation) considerations; and
- that the safety duty is an intrinsic part of a broader set of economic regulatory duties (i.e. it is part of the regulatory framework itself, making it distinct from 'safety functions' in other regulated industries).

The implication of the above is that there are clear and obvious reasons why, from a regulatory design perspective, one would be more concerned about 'preventing efficient investment' (i.e. 'quality being too low') than 'over-investment', in relation to air traffic, versus other industries. Put simply, because the consequences of underinvestment may be greater for NERL's customers than in other industries. Thus, this is consistent with the *'cost pass-through with capex governance'* arrangements that have been in place historically in the industry.

Relatedly, the above does not imply that underinvestment ('too low quality') in air traffic would inevitably compromise safety. Indeed, we understand that (and consistent with its own licence obligations) NERL would always reduce airspace capacity, rather than jeopardise safety. Thus, underinvestment might in practice be more likely to result in 'delays' (or, in the extreme, airspace being closed to prevent a risk from arising), than a deterioration in safety. Nonetheless, in the long-term this is clearly a matter of degree, as safety can only be maintained through investment. Thus, as above, this distinction in focus appears pertinent to the choice to implement 'capex cost pass-through' for NERL, rather than ex-ante allowances and incentives.

[13] 'The Railways Act 1993.' *As amended 2005; Section 4.*

3.3 Analysis of the characteristics of NERL's capex

Further to the relevant statutory duties, under the framework we developed in the previous chapter, the assessment of approaches to capex cost recovery and capex governance can also be informed by analysing the characteristics of NERL's capex, relative to other regulated industries. Hence, in the following, we provide an analysis of:

- capex intensity;
- the balance between tangible and intangible investment;
- asset lives / duration of investment;
- the volatility and controllability of capex investment; and
- the rate of technological change / predictability of required investments.

In the following subsections, we address each of the above in turn, highlighting relevant implications in each case.

3.3.1 Capex intensity

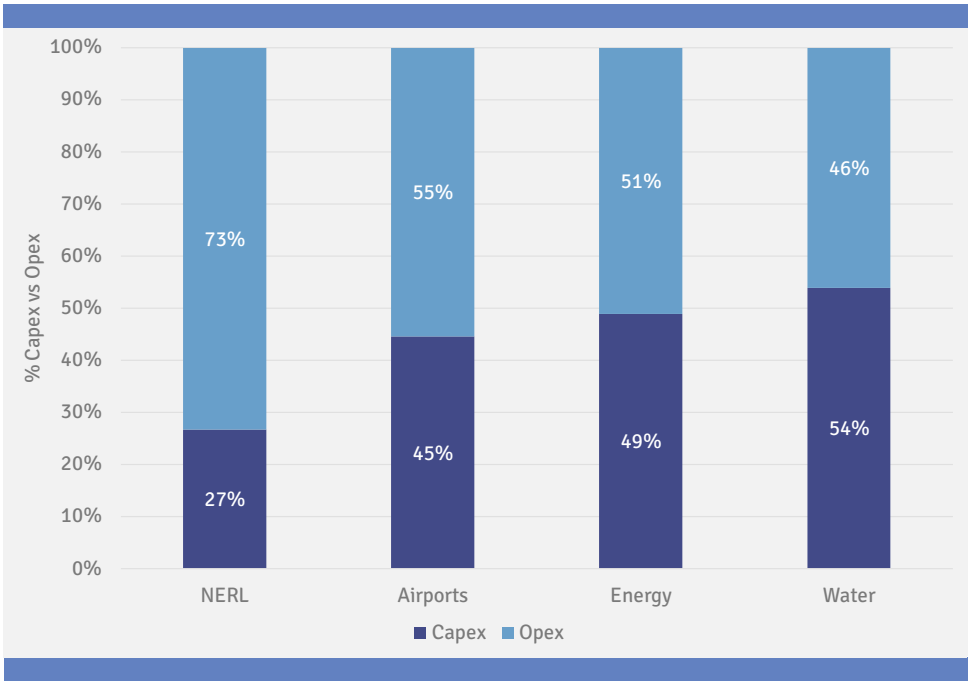
Figure 6 (overleaf) presents the split between capex and opex in four different regulated industries: (i) air traffic control; (ii) airports; (iii) energy; and (iv) water. The percentage split is calculated by taking the average capex and opex[14] spend in the most recent five years of readily available data. The data used is as follows:

- NERL's data is as reported in its annual financial statements, and covers the 5 year period 2014-2018 inclusive).
- Airports relates to Heathrow; and data is sourced from its annual accounts, over the 5 year period 2014-2018 inclusive).
- Energy relates to all DNOs (electricity networks) and is based on data published by Ofgem over the 5 year period 2011-2015 inclusive).
- Water includes all England and Wales water companies and is based on data published by Ofwat, over the 5 year period 2014-2018 inclusive).

[14] *Noting that this is not the same as operating costs, which include depreciation. Thus, where operating costs are reported in the raw data, depreciation, amortisation and impairments are added back so that the opex measure is consistent across the industries included in the figure.*

NERL IS MUCH LESS CAPEX-INTENSIVE THAN OTHER REGULATED INDUSTRIES. THIS IS RELEVANT TO WEIGHING UP THE RISK TO CUSTOMERS ARISING FROM 'UNDER', OR 'OVER', INVESTMENT (AS IT MEANS THE ADVERSE CONSEQUENCES OF THE LATTER ARE LESS MATERIAL FOR AIR TRAFFIC).

Figure 6: Split between capex and opex



Source: Economic Insight analysis of financial accounts and data published by regulators

As can be seen, NERL is much less capex intensive than the other industries, with capex accounting for only around a quarter of the company's costs. For comparison, the next least capex intensive industry is airports, which at 45% approximate more to other regulated sectors. Water is the most capex intensive regulated industry, with capex accounting for 54% of its costs.

When considering the choices relating to capex cost recovery, the implication of the above is that the 'downside' of inadvertently allowing inefficiently high investment will be lower in the case of NERL, relative to other regulated industries. That is, because 'capex' is only a small proportion of NERL's costs, the impact on bills / quality of allowing 'too much' investment will be relatively small. That does not, of course, mean that it is not appropriate for the CAA to be concerned with efficiency (and we discuss this further subsequently). Rather, it just implies that, relative to other industries, this is a further reason why when considering the *balance* between the risk of 'over' versus 'under' investment, the latter is logically the greater concern for NERL.

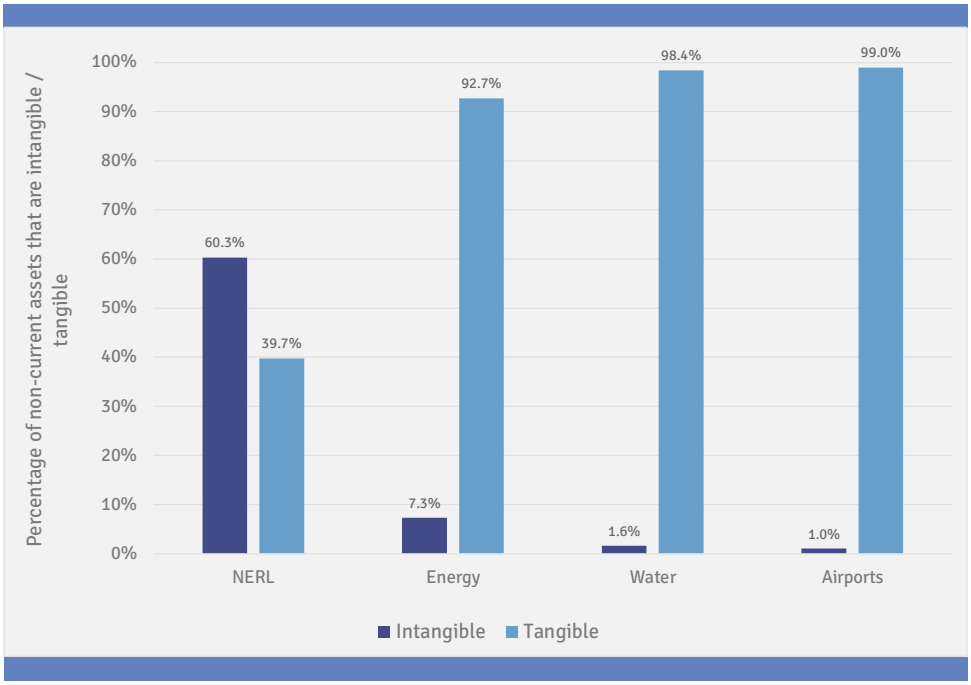
3.3.2 Split of tangible and intangible investments

We have further compared the split of intangible / tangible assets across the regulated sectors. Specifically, we have calculated the percentage split of non-current assets that are 'intangible' or 'tangible'. In each case, the data is based on the relevant companies' annual reports or statutory accounts - and relates to the most recent year of data available. The companies included are as per the preceding figure, other than for water, where the below data relates only to water and wastewater companies.[15]

[15] *For practicality purposes, the % split would be unlikely to vary if water only companies were also included.*

INTANGIBLES TYPICALLY ACCOUNT FOR A SMALL % OF INVESTMENT IN REGUALTED INDUSTIRES. HOWEVER, FOR NERL THEY ARE MATERIAL. THIS MEANS THERE IS FAR MORE UNCERTAINTY REGARDING THE PERFORMANCE OF NERL'S INVESTMENTS. RELATEDLY, IT ALSO MEANS EXPERTISE AND KNOWLEDGE IS CRUCIAL TO ASSESSING THE EFFECTIVENESS AND EFFICIENCY OF NERL'S INVESTMENTS.

Figure 7: Split between intangible and tangible assets



Source: Economic Insight analysis of financial accounts and annual reports

As can be seen, NERL's capital investment is considerably more focused on intangible assets than other regulated industries. Specifically, its accounts show that intangibles are over 60% of its non-current assets. The next nearest industry is energy (DNOs) with just 7%. In fact, we understand that the above analysis may be conservative, as accounting classifications of intangible assets mean that, for NERL, certain intangible investments will appear as tangible investments in its financial statements. Once this is taken into account, intangibles may account for nearer 70% of its investments. We expand on this further in Annex 3.

This is unsurprising, and reflects the realities of NERL's operations, which require it to invest heavily in software, more than in hardware or large infrastructure assets. Moreover, the software may often be bespoke, or highly specialised, which makes this form of intangible investment for NERL disproportionately more expensive relative to industries that tend to invest more in 'off the shelf' software (i.e. the nature of the software, being highly specialised, also explains why intangibles are a high % of total assets).

The main implication of NERL having a relatively high proportion of intangible assets, relative to other regulated sectors, is that it may generally be expected to face 'more risk'. There is a considerable literature that has sought to examine the relative 'risk' or opportunity cost of intangible, versus tangible, assets. As a whole, this suggests intangible investments are 'more risky' than tangible investments. For example, Schauten et al (2010)[16] undertook an analysis of the required returns on intangible assets in the US across 8 sectors. They found the required return was above the WACC. Gu and Wang (2005)[17] analysed the relationship between analysts' earnings forecasts

[16] *'The discount rate for discounted cash flow valuations of intangible assets.' Marc Schauten, Rudolf Stegink, Gijs de Graaff. Managerial Finance (2010).*

[17] *'Intangible Assets, Information Complexity, and Analysts' Earnings Forecasts.' Feng Gu and Weinin Wang; Journal of Business Finance and Accounting (2005).*

and firms' intangible assets. They find analyst forecast error increases with the degree of intangibles.

The relevance of the above to capex governance arrangements would seem to be as follows. Ex-ante, it is generally harder to assess the likely success (and returns generated by) intangible investments. Thus, expert technical knowledge of the investments in questions (e.g. software) and relevant operational experience would seem to be *especially important* to determining which investments are likely to be most appropriate and effective. Or, from a regulator's perspective, which are 'efficient' and which are most important to delivering the desired 'outcomes / quality'. As this expertise is most likely to sit within the organisation itself (e.g. NERL) this might limit the ability of other stakeholders to meaningfully make such assessments. Put another way, it would seem to imply that, to the extent governance arrangements were to include an assessment of efficiency or effectiveness, considerable care would need to be taken to ensure those making the assessments were suitably qualified to do so. The second implication is that the potentially greater ex-ante uncertainty regarding the performance of NERL's (intangible) investments seems to raise serious concerns regarding any incentives based on ex-post analysis. Specifically, it raises the question as to whether one can meaningfully distinguish between *'efficiency'* versus *'the benefit of hindsight'.*

SHORTER ASSETS LIVES FOR NERL MEANS IT TAKES INVESTMENT DECISIONS MORE FREQUENTLY. THIS MEANS THE 'PROCESS COSTS' FOR CAPEX GOVERNANCE MAY BE HIGHER FOR NERL THAN IN OTHER REGULATED INDUSTRIES. IT ALSO FURTHER MITIGATES THE FINANCIAL CONSEQUENCES FOR CUSTOMERS OF INEFFICIENT INVESTMENT OCCURING (I.E. BECAUSE THE COSTS OF THAT DO NOT PERSIST AS LONG).

3.3.3 Asset lives / duration of investment

The table below presents the average asset lives in the water, energy distribution, airports[18] and air traffic control sectors. As can be seen, NERL has an average asset life of 15 years, which is significantly shorter than assets lives typically observed across regulated industries.

Table 3: Asset lives by industry

Sector		Average asset life
Water	Water	25
	Wastewater	26
Energy	Gas distribution	45
	Electricity distribution	45
Airports	Heathrow	20
Air traffic control	**NERL**	**15**

Source: 'Principles and Guidelines for Regulatory Reporting' Ofwat (2017); 'RIIO-2 Finance Annex' Ofgem (2018); 'RP3 Business Plan Appendices' NERL (2018), p.57. 'Heathrow (SP) Limited Regulatory Accounts: Year ended 31 December 2018.'[19]

[18] *For consistency with the prior analysis, this relates to Heathrow.*

[19] *Calculated as average RAB for 2018 (£15,994m) divided by ordinary depreciation (£802m), giving an overall average asset life of 19.9 years.*

The relevance of this to capex governance is as follows. Firstly, it means that NERL takes investment decisions 'more frequently' than in other regulated sectors. All else equal, this would seem to imply that the process costs associated with capex governance will be higher in relation to NERL (noting that the impact of this in practice will increase the more 'complex' and 'involved' said governance arrangements are). Secondly, by virtue of investments being renewed 'more frequently', the impact of technological change on capex costs / operational performance will be greater in the case of NERL (i.e. even if technology for NERL only changed at the same pace as in other industries, more frequent asset renewal means its impact will be felt more quickly). In practice, evidence suggests NERL faces a relatively high rate of technological change. Combined, this might imply that it is harder for NERL (or a relevant stakeholder) to determine 'in advance' what investments are most efficient.

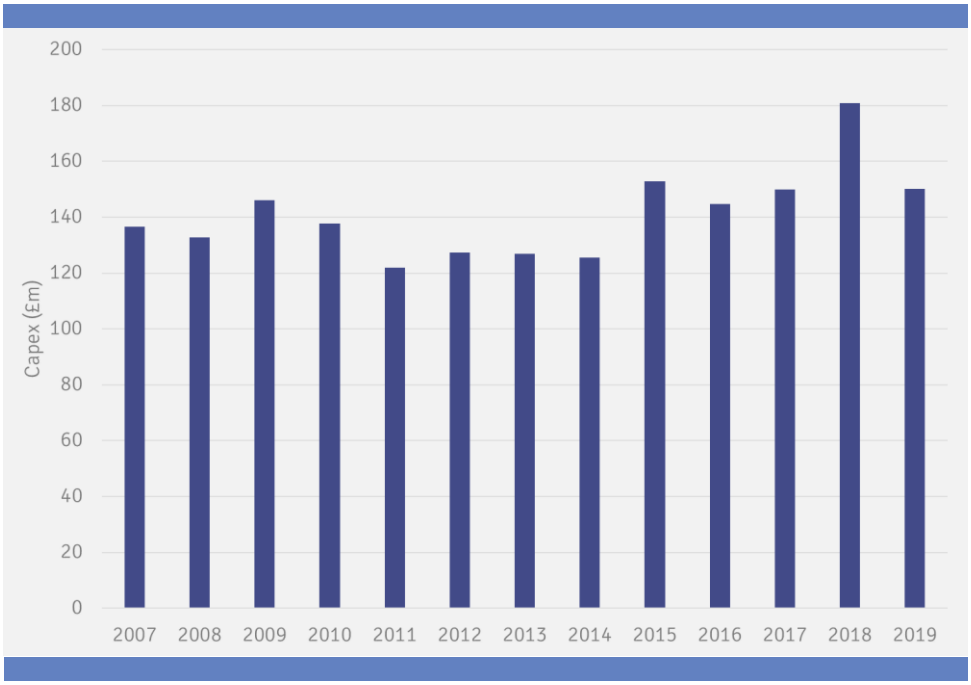
For example, in the water industry, if a company needs to address a material supply/demand deficit in 'x' years hence, there would most likely be a relatively limited number of infrastructure asset options for doing so. Further, the 'nature' of those investments is unlikely to materially change rapidly. Whereas, for NERL, where the investments are more in software etc, and need to be considered more frequently, clearly the available and suitable options might change more rapidly.

The shorter asset lives for NERL also further mitigate any potential adverse impact on customers of allowing inefficiently high investment. That is to say, the impact only persists for a period of 15 years, whereas in other industries, such impacts would persist for much longer. Again, therefore, this further shows why, in NERL's case, there should logically be more concern regarding 'not allowing efficient investment', rather than 'allowing inefficient investment'.

3.3.4 The volatility and controllability of investment

There is also substantial variation in NERL's capex over time, due to its 'lumpy' nature. Indeed, a new software system does not need to be installed each year and so capex will naturally vary. The following figure presents NERL's annual capex between 2007 and 2019. As can be seen, capex does not follow a linear trend, and varies considerably over time. Such variability in capex is not, however, unusual and is common across most industries.

Figure 8: NERL's annual capex



Source: Economic Insight of NERL's financial accounts

Alongside its main statutory functions and duties, NERL is also responsible for delivering projects which are not under its command. This is relevant because it shows that capex spend is not entirely within NERL's control.

Outside influence on NERL's capex is well evidenced in NERL's role in the Airspace Modernisation Strategy (AMS), a project co-sponsored by the Department for Transport and the CAA. Some examples of initiatives which NERL is responsible for are set out in the table below.[20] As can be seen, a number of the initiatives are EU requirements, and so are outside of the control of NERL.

Table 4: Examples of delivery of AMS initiatives

Initiative	Who leads delivery?	What plan(s) exists for delivery?	How will initiative be funded?
Direct Route Airspace (EU requirement)	NERL	NERL capex plan.	NERL core costs. Airlines to fund their own equipage costs.
Free Route Airspace (EU requirement)	NERL within BOREALIS	NERL capex plan.	NERL core costs.
Advanced Flexible Use of Airspace	NERL	NERL capex plan, in IBP as core.	NERL core costs MoD expenditure also required.

Source: 'Airspace Modernisation Strategy Annex' Department for Transport (2017)

[20] *'Airspace Modernisation Strategy Annex' Department for Transport (2017), p.9.*

The implications of the above for capex governance are twofold. Firstly, the fact that NERL's capex can, in part, effectively be mandated or influenced by other stakeholders further contributes to it being hard to predict, years in advance, what the 'efficient' level of capex for NERL should be. Secondly, it means it is important that any governance arrangements allow NERL to respond flexibly to changing requirements.

'The technological and economic landscape of air traffic services has been rapidly changing in recent years.' -

DfT

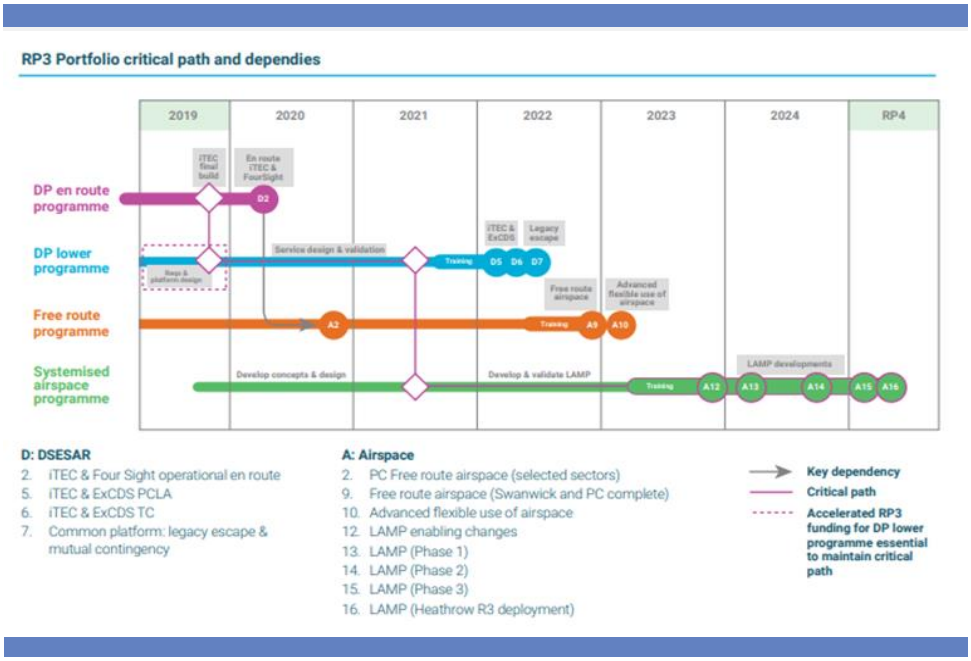
3.3.5 Evidence on the rate of technological change / predictability of investment

Another feature of NERL's capex is that efficient costs and preferences can change relatively rapidly. Indeed, the Department for Transport notes that "*the technological and economic landscape of air traffic services has been rapidly changing in recent years*".[21] Related to this, we previously noted that in the air traffic control industry, software is often bespoke. These facts imply that capex will likely be scoped 'on the fly', and further highlights the high degree of uncertainty in NERL's capex.

The above is reflected in the *overall* high degree of uncertainty NERL identifies relating to its RP3 capex programme. Specifically, NERL's capex costs are estimated on a 'most likely' basis and range between £725m and £800m for RP3, with NERL stating that this represents "*the uncertainty that remains looking in a complex portfolio some 7 years ahead*".[22] NERL has also set aside a contingency fund of £30m to address any risks or new requirements over RP3.

In addition, NERL's capex portfolio is highly integrated and there are key dependencies between programmes. Figure 9, which presents cross-programme dependencies for RP3, shows that the delivery of DSESAR, is required before airspace change can be implemented, for example. Furthermore, we understand from NERL that its capex is also highly dependent on the delivery of its operational spend, especially with regard to the training of controllers.

Figure 9: RP3 cross-programme dependency



Source: 'RP3 Business Plan Appendix L' NERL (2018)

[21] *'Modernising the Licencing Framework for Air Traffic Services' Department for Transport (2016).*
[22] *'Responses to Information Requests' NERL (2018), slide 33.*

3.4 Implications of NERL's industry characteristics

Drawing the preceding subsections together, Table 5 summarises the relevant implications of the features of NERL's capex for capex cost recovery and governance.

Table 5: Summary of analysis and implications for capex cost recovery and governance

Feature of NERL's capex	Implications for capex cost recovery and governance arrangements
Pre-eminence of safety	The downside consequence for customers of underinvestment (quality being 'too low') will be greater than the downside consequence of overinvestment.
Low capex intensity	As above, because the financial impact on customers of 'inefficiently high' capex for NERL is lower than for other regulated industries.
High proportion of intangibles	NERL faces significantly more uncertainty (and risk) relating to the performance of its investments, relative to other industries. This further means that expertise / experience of said investments (e.g. software) is particularly important to appraising their effectiveness and efficiency. It may also mean that ex-post assessments of efficiency and effectiveness do not reflect ex-ante risk.
Short asset lives	NERL has to make investment decisions more frequently than other regulated sectors. Consequently, the process costs of governance are likely to be higher in relation to NERL than elsewhere. In addition, it is consistent with a higher rate of technological change / scope for 'efficient' solutions to change more quickly than in other industries.
Volatile capex partly outside of NERL's control	Contributes to efficient investment being hard to predict in advance. Means it is important NERL can respond flexibly to changing requirements.
High rates of technological change	Contributes to 'efficient' capex being difficult to predict in advance.

Source: Economic Insight

Stepping back, we would summarise the main implications for NERL's capex governance as follows:

- **The consequences for customers of 'underinvestment' are likely to be much more material than the consequence of 'overinvestment' for NERL.** This, of course, explains why NERL has capex cost pass-through in the first place, rather than formal ex-ante capex cost allowances with incentives, as exist in energy and water. However, this 'balance' of risk is also highly relevant to the determination of appropriate capex governance. That is to say, whilst it is clearly appropriate for the CAA to pay attention to the possibility of allowing 'inefficient' investment in the short term (e.g. 'too high costs') we would expect any governance arrangements to reflect the fact that the downside of this for customers would seem to be much lower than the opposite 'mistake'.

- **The process costs of capex governance for NERL will be proportionally higher, relative to other sectors (like-for-like) due to the higher frequency**

with which investment decisions are made. Therefore, to the extent that governance arrangements seek to create or strengthen efficiency incentives through 'process', one would need to robustly appraise the likely cost of that (taking into account possible benefits, in light of the above 'balancing' considerations).

- **The effectiveness / efficiency of capex investments is hard to predict in advance for NERL.** This would seem to further limit the likely benefits of 'strengthening' governance arrangements as a means of promoting nearer term efficiency. It also raises the question of whether ex-post assessments embed a 'benefit of hindsight' lens, which does not accurately reflect the risk that NERL faced on a forward-looking basis. It also means that the effectiveness of any governance arrangement is likely to be highly contingent on the expertise and experience of the relevant stakeholders involved.

4. Evaluation of proposed approaches

In this chapter we set out our evaluation of the capex governance arrangements proposed by NERL and the CAA. The respective proposals of the parties are similar in a number of ways, but differ in two important respects. Firstly, the CAA proposes to extend the role of the Independent Reviewer to include assessing NERL's capex programme. Secondly, the CAA proposes to introduce delivery, efficiency and information financial incentives that allow it to evaluate NERL's capex performance and apply financial penalties on an ex-post basis. Thus, the CAA's proposals represent a material departure from previous regulatory approaches (and, in relation to the three incentive mechanisms, their inclusion came relatively late in the development of the method for RP3). We evaluate the proposals of the CAA and NERL in relation to: (i) effect on the probability and consequence of inefficient investment decisions; (ii) effect on financial risk; and (iii) process costs. We find that neither parties' proposals started from a well-defined framework that allows one to easily identify the 'problem' being addressed. However, in practice, the CAA's proposals raise the more serious concerns. Specifically, the regulator's proposals place considerably more weight on 'near term' efficiency (such as cost minimisation) which ignores the fact that in air traffic control, the avoidance of inadvertently preventing efficient investment / 'low quality' is much more important to protecting customers. Whilst NERL's own proposals include some more modest rebalancing (the impact of which is less pronounced and is more consistent with the industry's characteristics).

Using the framework set out in chapter 2, here we present an evaluation of the approaches to capex governance proposed by NERL and the CAA. We first provide an overview of the finalised proposals. We then set out our assessment in detail, addressing each evaluation criterion in turn.

4.2 Overview of approaches proposed by NERL and the CAA

In the following we provide an overview of the respective proposals of the CAA and NERL as regards capex governance at RP3. A more detailed description of the proposals – including a timeline – is contained in Annex 2.

4.2.1 Final proposed approaches to capex governance at RP3

As there are many components of the final capex governance arrangements proposed, for summary purposes it is helpful to identify *the key points of difference* between the CAA and NERL. These are as follows:

- The CAA proposes an **'enhanced role' for the Independent Reviewer** (IR), which moves their responsibility away from an assessment of the reliability of NERL's reporting, towards an assessment of its actual and proposed capital investments (i.e. efficiency and delivery). NERL does not support this change.

- The CAA proposes three **new incentive mechanisms**: a delivery incentive; an ex-post efficiency incentive; and an information incentive. NERL does not support these.

Below we briefly expand on the above.

4.2.1.1 Enhanced role for the Independent Reviewer

The CAA's Final Decision set out its views on the role of the IR. Here, the CAA determined that the IR's role at RP3 should include the following:

- consider NERL's process for user engagement in its capital governance arrangements;
- assess how well NERL has explained/justified its capital programme in its SIP;
- review the accuracy and timeliness of NERL's reporting in its SIP;
- track and assess NERL's progress in **delivering** its investment plan and achieving the associated benefits; and
- report on the **cost efficiency** of NERL's capex.

As regards reporting, the CAA said the IR shall provide: (i) reports on each SIP and Interim SIP (i.e. two reports a year); and (ii) ad-hoc reports on various aspects of NERL's capital programme – e.g. efficiency.[23]

4.2.1.2 Capex delivery incentive

The CAA stated that it would introduce a capex delivery incentive. This would be based on an on a 'general assessment' of NERL's delivery performance, but with a focus on: (i) DP (en route) and DP (lower) technology changes to provide a common platform for the Swanwick and Prestwick centres; (ii) AD6 airspace change to increase capacity to Stansted and Luton airports; and (iii) LAMP airspace changes to modernise airspace in South-East England, in the context of the airspace change masterplan.

In practice, the IR will produce an annual report on NERL's capital expenditure delivery to inform the CAA's determination of whether / how to apply the incentive.

[23] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 129.*

The CAA's Final Decision does not contain much detail on the scope of said report, other than it will 'likely' include an overall assessment of NERL's delivery, in addition to delivery against specific milestones for the above priority areas. The CAA further set out that the incentive will be capped at a £36m penalty. It could take the form of either a revenue reduction, or RAB reduction, applied at the start of RP4.

The CAA also stated that, as part of applying the incentive, it would be prepared to amend specific milestones (used to assess deliverability) if there was sufficient evidence that the changes would benefit users (and that there was evidence of user support for said amendment). However, it nonetheless noted that its starting presumption was that NERL should deliver its RP3 investment plan "in full".[24]

4.2.1.3 Ex-post capex efficiency incentive

The appendices to the CAA's Final Decision describe the ex-post efficiency incentive as follows: *"before RP4, we will commission an independent review, or reviews, of the cost efficiency of NERL's RP2 and early RP3 capex. If the review(s) identifies any expenditure as inefficient, we may decide to disallow some or all of the inefficient spend. This will be achieved through a downwards adjustment to NERL's starting RAB for RP4".*[25]

The CAA further suggests that the IR will be the responsible party for assessing the efficiency of NERL's capex for the purpose of determining whether to apply the incentive. However, the CAA is unclear as to exactly 'how frequently' the IR would undertake these assessments, referring to them in the context of describing 'ad-hoc' reports to be provided by the IR (but we also note that the IR will produce six monthly reports on the annual and interim SIPs respectively, the scope of which could also include efficiency).[26]

4.2.1.4 Capex information incentive

Under the information incentive, the CAA proposed that any over-spend by NERL during RP3 would only be remunerated at the cost of new debt, rather than the WACC, if there are: *"significant weaknesses in NERL's ongoing provision of information on its capital spending programmes".*[27]

The CAA further set out that the incentive would be used when it considered there were 'serious failings' in the provision of information to justify an overspend, either at the project or programme level, or on capex in totality. The CAA defined a 'significant failure' as being where NERL has offered no reason for an overspend, or had provided information at 'too high' a level to make an assessment of why the overspend occurred. As per the efficiency incentive, the financial impact of the information incentive would be in the form of a one-off reduction in revenues or the RAB at the start of RP4. Whilst the CAA's proposals do not seem to have been developed in much detail, it seems possible that there might also be an ex-post element to the information incentive.[28]

---

[24] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 127,*
[25] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 127,*
[26] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 129,*
[27] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 127,*
[28] *For example, if NERL had 'already overspent' at the time at which the IR/CAA deem its information to be insufficient, the penalty would seem to impact the return on capex already incurred. The penalty could be designed in order to preclude this possibility – however, the CAA's proposals do not clarify this.*

THE CAA'S PROPOSED DELIVERY, INFORMATION AND EFFICIENCY INCENTIVES FOR CAPEX ARE 'NEW' FOR RP3. SPECIFICALLY, WHILST THE CAA PREVIOUSLY CONSIDERED EFFICIENCY AND INFORMATION WHEN EVALUATING NERL'S BUSINESS PLANS (I.E. FUTURE PROPOSED CAPEX) THE RP3 PROPOSALS: (I) ASSESS THESE MATTERS 'AFTER THE EVENT' ON A BACKWARDS-LOOKING BASIS; AND (II) APPLY DIRECT FINANCIAL INCENTIVES BASED ON THIS.

4.2.2 Key changes relative to RP2

In order to inform an evaluation of the respective positions of the CAA and NERL, it is helpful to clarify the extent to which the above proposals represent a departure from RP2 and previous price controls. This does not, of course, imply that changes to governance at RP3 are inappropriate. That is a matter of evidence, which we address subsequently. Rather, clarifying the 'change' implied provides a helpful way of understanding the proposals themselves further.

In relation to **the role of the IR**, at prior price controls, this was limited to reporting to the CAA on the reliability and accuracy of NERL's information and data relating to capex. The CAA's proposed change at RP3 is that the IR becomes responsible for assessing the *performance* of NERL's capital programme as regards information; efficiency; and delivery.

In relation to the **incentive mechanisms** proposed by the CAA, Annex 2 provides a full description of relevant approaches at prior price controls. However, in summary, the incentive mechanisms proposed by the CAA for RP3 are 'new' (i.e. they did not apply at RP2). In fact, they seem to represent a material departure from prior approaches. The key points seem to be as follows:

- The CAA's proposed **delivery** incentive is new in its entirety. Nothing similar applied at RP2, or prior price controls.
- When determining whether to endorse investment at any given price control (e.g. RP2) **efficiency** has always been an important consideration. Thus, the CAA's view of efficiency has always *implicitly* been a factor in its determination of whether and 'how much' investment should be included in the RAB. However, what was being assessed was 'new' proposed investment for the price control in question (i.e. it was forward-looking, as part of an assessment of NERL's proposed plans). For example, as noted above, the assessment of the RP3 investment plan was *informed by* an assessment of efficiency at RP2. In contrast, the ex-post efficiency incentive proposed by the CAA at RP3: (i) allows for the possibility for this assessment (and incentive) to be applied to investments already made; and (ii) creates for the first time a formal link between that assessment and (retrospective) allowed revenues / the RAB.
- When determining whether to allow investment at any given price control (e.g. RP2) there was a requirement that stakeholder views were taken into account. By definition, this means that **information** necessary to facilitate that must have been shared. However, unlike the proposed information incentive, this merely helped determine 'whether' new investment should proceed (i.e. therefore be added to the RAB). In contrast, the information incentive proposed at RP3: (i) may allow this assessment to apply to investment already made; and (ii) imposes a direct financial incentive element, by way of a reduction in the allowed return to the cost of new debt.

4.2.4 Summary of finalised proposals

To help further illustrate the points of difference, the following table summarises our understanding for finalised positions of each party, and compares these to the arrangements in place at RP2.

Table 6: overview of final positions in relation to capex governance

Governance element	Status quo	Relative positions of CAA / NERL	
	RP2	CAA Final Decision	NERL (Revised Business Plan / response to Final Decision
Governance processes	*Note: RP3 proposals include these processes in addition to those listed right.* Annual and interim SIP. IR role is to assess the accuracy of NERL's reporting (as stipulated in licence condition). Stakeholder engagement around SIP (including updates through FASIIG meetings).	*Note: these are 'over and above' the RP2 processes (shown left).* Proactively engage with broad user group on any programme changes over RP3 (wherever possible). Mandatory requirement to consult users on schemes >£10m. Frequent engagement with key stakeholders (timely). Escalation process (as per NERL). Enhanced role for the IR – including assessing efficiency, delivery and info quality to inform incentives – and reporting back to CAA. Agreeing baseline against which RP3 performance can be assessed. Pre-agreeing key programme milestones that will be tracked. Changes to milestones subject to approval.	*Note: these are 'over and above' the RP2 processes (shown left).* Proactively engage with broad user group on any programme changes over RP3 (wherever possible) Regular deep-dive sessions to cover subjects of key interest to customers Six-monthly updates to airports and other stakeholders through the FASIIG framework. Escalation process. An enhanced role for the IR, with regular quarterly review meetings based around NERL's portfolio dashboard Annual review with customers, as part of the interim SIP. Agreeing baseline against which RP3 performance can be assessed. Pre-agreeing key programme milestones that will be tracked.
Governance reporting	Annual SIP and interim SIP.	Annual SIP; interim SIP; and quarterly reporting dashboard.	Annual SIP; interim SIP; and quarterly reporting dashboard.
Incentives			
Delivery incentive	Does not apply	IR assesses delivery on a six-monthly basis (i.e. an annual report on both the annual and interim SIP). Penalties capped at £36m (applied as either a reduction in revenue or RAB at start of RP4).	Does not apply.
Ex-post efficiency incentive	Does not apply (the CAA has previously commissioned efficiency assessments of NERL's proposed capex at prior controls. These have been informed by assessments of the efficiency of capex at preceding price controls. However, there has not been any mechanism that applies financial penalties to previously incurred capex after the event).	The CAA refers to commissioning a review / or reviews of efficiency. In addition, the CAA suggests IR assesses ex-post efficiency of capex on an ad-hoc basis, and then advises the CAA. Efficiency assessment potentially also six-monthly, if included within scope of the IR's annual and interim SIP reports. CAA determines whether to exclude from the RAB.	Does not apply (RP2 status quo persists).
Information incentive	Does not apply (although licence conditions require NERL to provide certain information).	Remunerating any capex overspend at the cost of debt, rather than the WACC, where the quality of information provided by NERL is deemed insufficient (applied as either a reduction in revenue of RAB at start of RP4).	Does not apply (RP2 status quo persists).

Source: summarised from CAA / NERL RP3 publications

As can be seen from the above, the 'process' elements of the proposals of each party are relatively similar. Specifically:

- Both proposals involve the same stakeholders. That is, both proposals include consultation with customers, a role for the CAA (e.g. in relation to the escalation process), and a role for the IR.

- Both proposals include the sharing of similar information in similar ways, although there are differences. The SIP process is central to both proposals. However, the CAA is proposing to modify NERL's licence to require quarterly updates to the SIP process and consultations on new projects with an estimated spend over £10m. Whereas, NERL is proposing consultations with customers 'where possible'. It also specifies that deep-dive sessions will take place around topics of most interest to customers.

- In relation to timings, both proposals include quarterly updates e.g. NERL proposes a quarterly meeting with the IR around the dashboard, followed by the dashboard being shared with customers and the CAA; whereas the CAA propose changing NERL's licence condition to *require* quarterly updates to the dashboard.

Overall, there appears to be a number of similarities between the proposals in terms of 'process', but we understand that the CAA's proposals are more demanding and stringent e.g. the requirement of the IR to evaluate delivery, efficiency and information provision.

4.2.5 Timeline overview

The timeline below sets out the main steps the CAA and NERL took in developing their proposals. It is relevant to the matters before the CMA, because it specifies the guidance that the CAA provided to NERL, along with some of the principles that informed the CAA's approach. Please see Annex 2 for further details.

- In March 2017, the CAA published a discussion document related to the strategic outcomes it wanted to achieve from the economic regulation of NERL in RP3. In relation to the strategic outcome of 'effective accountability mechanisms', the CAA suggested that it would be important that: (i) customers could meaningfully input into NERL's investment planning processes; and (ii) NERL could be held accountable for the delivery of appropriate airspace change on time and to budget, through regulatory interventions and incentives.

- In January 2018, the CAA published its Business Plan Guidance. The CAA identified 'effective accountability' as the main theme of the guidance. The CAA noted that NERL had the opportunity to *propose* arrangements for shared governance (sharing of decisions) and financial incentives (sharing of risks) to engage a wider community of stakeholders in managing and sharing those risks. The CAA said that the role of the IR would be central to making shared governance an effective alternative to a high level of pre-specification for capital programme outputs and associated strong performance incentives.

- In its 25th May 2018 letter, the CAA said that NERL's Initial Business Plan had not demonstrated greater *ownership* and *accountability* for its plan, including in relation to shared governance arrangements. The CAA stated that there appeared

to be very limited proposals to move shared governance forward and develop the role of the IR.

- NERL published its Revised Business Plan in October 2018. It included a range of enhancements to the RP2 capex governance approach as summarised above.

- In February 2019, the CAA published its RP3 Draft Performance Plan proposals. The CAA set out 'more enhanced' capex governance arrangements, compared to those proposed by NERL. The CAA's proposals included the broad scope of: an efficiency incentive based on an ex-post review; and an information incentive.

- In April and June 2019, the CAA published a 'working note' and a 'draft note' on the policy and processes for capex governance. The notes raised the potential risk that the capex governance arrangements would unintentionally transfer accountability from NERL to other stakeholders. In the latter note, the CAA set out the principles that had guided its proposed capex governance policy – including that NERL should be financially incentivised to provide sufficient information to airline users and other stakeholders, to spend capex efficiently, and to deliver projects on time. The June 2019 note also set out three capex incentive mechanisms more formally: ex-post efficiency incentive; information incentive; and delivery incentive.

- In August 2019, the CAA published its final decisions. The CAA's proposals included further enhanced capex governance arrangements, compared to its draft proposals.

4.3 Our evaluation

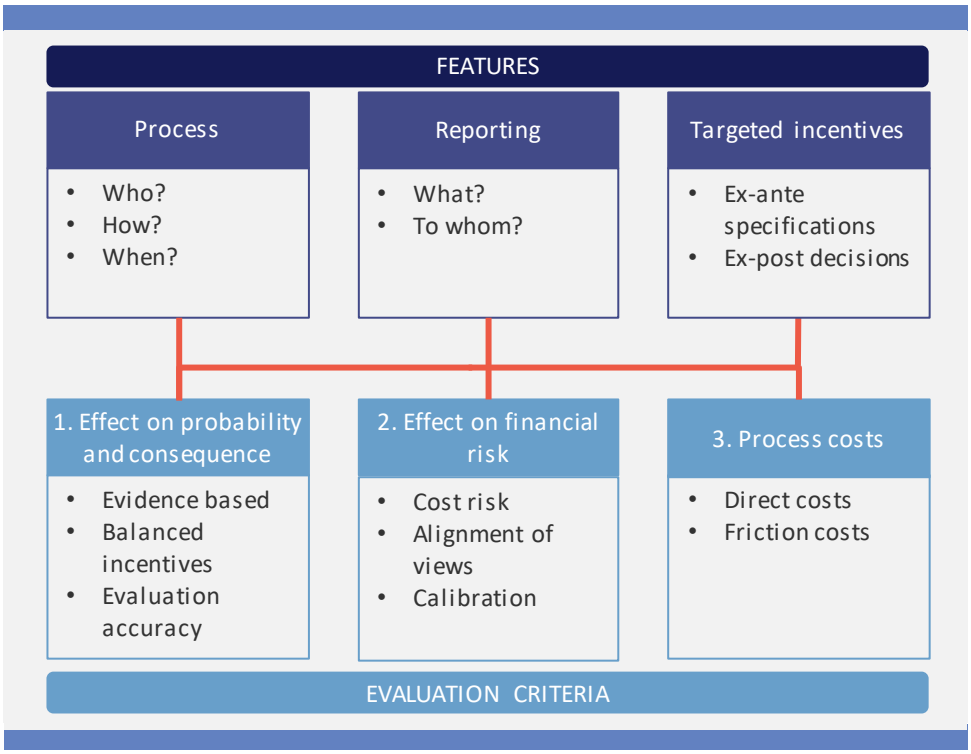
In the following, we set out our evaluation of the respective proposals pertaining to capex governance arrangements. These are structured around the framework we developed in Chapter 2, as summarised again in Figure 10 (overleaf) for convenience. Our assessment is predominantly 'qualitative' in nature, although it is informed by the evidence in Chapter 3, where appropriate. This reflects:

- the nature of the issues that must be considered, which in some cases are inherently 'subjective' and cannot be readily informed with data or quantitative analysis; and
- the current availability of evidence.

Consequently, it may be possible to develop additional evidence and analysis in due course, to further inform certain aspects of the evaluation.

Consistent with the above, here our aim is therefore to provide the *'best currently possible'* assessment of the proposals – and therefore, to help identify issues that the CMA may wish to consider as part of its redetermination.

Figure 10: Framework for evaluating capex governance arrangements



Source: Economic Insight

4.3.1 The effect on probability and consequence

As we described in Chapter 2, where cost pass-through exists, the logical implication is that the downside of 'too low quality' and 'underinvestment' is greater for customers than the downside of 'too high prices' in the short run. However, 'governance' may nonetheless be proposed if a regulator considers some 'rebalancing' between these two considerations is appropriate. In the following, we therefore assess the evidence relating to this, as regards the CAA's and NERL's proposals, addressing the sub-criteria outlined in the above figure.

NEITHER PARTIES' GOVERNANCE PROPSOALS STARTED FROM AN ASSESSMENT OF WHETHER THE CURRENT BALANCE IS APPROPRIATE.

4.3.1.1 Are the proposals evidence based and targeted?

To have reached a conclusion that *some* rebalancing between the risk of 'underinvestment' and 'overinvestment' is appropriate, we would expect any proposals to start from evidence that the current balance is inappropriate.

In this regard, we consider the proposals of both the CAA and NERL to be deficient. Specifically, neither parties' start from a well-defined description of the 'problem' that they are seeking to solve. However, this is more troublesome when considering the CAA's proposals, as (due to the inclusion of three new financial incentives) it is proposing a much more significant change, relative to RP2, than NERL.

Specifically, the CAA's proposal to include an ex-post efficiency incentive implies it considers 'too little' weight is being applied to near-term technical efficiency. Similarly, the CAA's proposal to include an information incentive implies it considers 'too little' weight is currently being applied to near-term allocative efficiency. The CAA's proposal to include a delivery incentive would also seem to imply that 'too little' weight is being attached to nearer-term efficiency.

Having reviewed the various publications by the CAA and its consultants (see Annex 2) we find that there is little to no evidence to support the above supposition. Specifically, the only relevant issues cited by the CAA appear to be:

- Frequent references to the change in scope of NERL's capex programme early on RP2. Here the CAA states in various places that NERL's forecast costs increased by around 25%.[29]

- References to customers / users wanting to be 'more involved' in NERL's investment decisions.

In our view, the former observation is inadequate to reach a conclusion that near term technical and allocative efficiency are not being sufficiently prioritised. Specifically, there is a lack of evidence and analysis relating to: (i) why NERL's capex programme changed at RP2; (ii) whether, and to what extent, that change might, therefore, be considered evidence of inefficiency; and (iii) what would have occurred had NERL not adapted it RP2 capex programme and what the implications of this were for customers.

The latter observation goes to a more fundamental consideration. Namely, that capex cost pass-through is being deployed for NERL precisely because the downside of 'low quality' or 'underinvestment' is logically much greater than the opposite. Hence, if users or other stakeholders are asked in isolation whether they would prefer 'more governance' that specifically incentivises more information sharing / more focus on nearer term costs, they might well say 'yes'. However, *that is the wrong question.* The question is whether they might prefer more weight to be placed on this, at the expense of less weight being attached to the risk of underinvestment / lower quality over time.

In relation to NERL, we similarly find that its proposals have not started from an assessment of the current 'balance' between the above risks.

Consequently, we rate both sets of proposals as **'low'** on this criterion. However, this is more pertinent to the CAA's position than NERL's, for the reasons outlined above.

4.3.1.2 Do the revised proposals strike an appropriate balance?

As we explained in Chapter 2, once one understands that governance arrangements should be designed to create some rebalancing between different forms of efficiency, it is important to assess their incentive properties in practice – so as to determine whether an appropriate balance is likely to be struck. Here, we would characterise the proposals of the parties as follows:

- **NERL's proposals prioritise avoiding the risk of underinvestment and 'too low quality'.** Specifically, they include no near term ex-ante efficiency incentives or ex-post adjustments, such that the company will remain certain it can recover the capex it incurs. The 'enhanced' elements of its governance processes nonetheless are likely to mean that *somewhat* more weight is attached to technical and allocative efficiency in the short-term than has been the case at prior price controls.

[29] *For example, see: 'UK RP3 CAA Decision Document.' The CAA (August 2019); page 75.*

'There seems to be a tension between the logical rationale that underpins why NERL is subject to capex cost pass-through in the first place, and the CAA's governance proposals for RP3.'

- **The CAA's proposals appear to place materially more weight on nearer-term technical and allocative efficiency - and so come with increased risk of 'too low' quality and underinvestment.** Most obviously, the 'ex-post' assessment of NERL's capex means that NERL can face financial penalties in the form of reductions to its RAB and / or revenue in relation to investments *already made,* which are subsequently deemed to be inefficient.

Based on the analysis set out in Chapter 2, the CAA's proposals do not, at face value, appear to strike an appropriate balance. Specifically, they do not reflect the key relevant characteristics of the industry. Namely being: (i) high adverse consequences of underinvestment (delays and safety); (ii) low capex intensity; (iii) high intangibles intensity; (iv) short asset lives; and (v) relatively high rates of technological change. Put simply, there seems to be a tension between the logical rationale that underpins why NERL is subject to capex cost pass-through in the first place, and the CAA's governance proposals for RP3. Indeed, as we subsequently explain, the 'ex-post' nature of the CAA's proposals appear especially problematic.

In contrast, NERL's proposals appear to strike a balance more consistent with the industry's features. Namely, the need to avoid potentially efficient investment not being approved / too low quality is prioritised over other considerations. The slight strengthening of nearer-term efficiency implied by the enhanced governance processes may, or may not, be justified (due to the lack of evidence discussed in the previous subsection we cannot form a strong view on this).

We therefore rate the CAA's proposals as **'low'** on this criterion, and NERL's as **'high'.** However, this is an area where further evidence and analysis could be developed – and this is something the CMA may wish to consider. For example, this could include:

- more detailed analysis of whether, and to what extent, previous changes in the capex programme for NERL reflect 'technical' or 'allocative' inefficiency – as opposed to them being for good, efficiency enhancing, reasons; and
- analysis of how NERL might behave in the presence of ex-post capex incentives and whether, in light of this, outcomes for customers are likely to have been 'worse' or 'better'.

4.3.1.3 How accurate is the evaluation likely to be?

As we explained in Chapter 2, 'even if' the starting point for any proposals is well-evidenced and 'even if' the balance of incentives is appropriate, the desired rebalancing will only succeed in practice if any assessments on which interventions depend are 'accurate'. In the case of NERL, that turns on the accuracy with which one could determine whether its investments are 'technically' and 'allocatively' efficient.

Here, before considering the proposals of the CAA and NERL, it is important to note the relevant features of the industry. Specifically, the lack of 'comparative' data to allow for benchmarking of capital cost efficiency intrinsically limits the extent to which efficiency can be robustly determined. For example, in the water and energy sectors, capital costs are, to various degrees, benchmarked for efficiency.[30] In addition, and as we showed in Chapter 2, NERL's capital is heavily focused in intangibles. We explained that evidence shows the performance of intangible assets is more 'uncertain' and 'riskier' relative to tangible assets. We also noted that NERL's

[30] *Costs are typically benchmarked at the 'totex' level, but this includes capex.*

THE FEATURES OF THE INDUSTRY MAKE THE ASSESSMENT OF THE EFFICIENCY AND EFFECTIVENESS OF CAPEX CHALLENGING. THUS, EVEN IF THE CAA'S PROPOSALS STRUCK THE RIGHT BALANCE OF INCENTIVES IN THEORY, THEY WOULD NOT NECESSARILY REDUCE THE LIKELIHOOD OF ALLOWING INEFFICIENT INVESTMENT.

investments are subject to technological change and are highly bespoke and specialised. In summary, therefore, we consider that the accurate assessment of capex efficiency (which, in general across regulated industries, is accepted as being 'difficult') would seem to be *especially challenging* with regard to NERL.

Turning to the relevant differences between the CAA's and NERL's proposals, we would further raise the following observations:

- The 'accuracy' with which efficiency is assessed has far more material implications under the CAA's proposals than under NERL's. This is because under the CAA's proposals, there is the possibility of investment not being remunerated at all, or being remunerated at a lower rate of return. Consequently, the inherent difficulties in assessing efficiency accurately (as above) are especially troubling, were the CAA's approach to be implemented.

- The ex-post nature of the assessment and incentives proposed by the CAA further complicates the accurate identification of efficiency. That is to say, it risks conflating the 'benefit of hindsight' with 'genuine efficiency and performance risk'. There does not appear to be any easy way to resolve this.

- The prospect of financial incentives under the CAA's approach *may* result in NERL itself developing 'higher quality' evidence and analysis with which to measure and evaluate the efficiency of its capex programme. All else equal, this may *improve* accuracy, relative to NERL's proposals, therefore (i.e. in this respect, the CAA's approach has merit). However, for the reasons outlined above, developing robust evidence on this is intrinsically challenging in this industry. Thus, it is hard to say 'how large' any such benefit may be.

- In the main, both the CAA's and NERL's proposals include engagement with a relatively similar group of stakeholders. We consider minor differences in 'how much' or 'how often' said engagement occurs will have relatively little impact on the accuracy of any efficiency assessment.

- Under the CAA's approach, the IR will play a key role, being both responsible for reports on the SIP (that can include efficiency) and for providing 'ad-hoc' reports (where the scope may also include efficiency). It seems doubtful to us that the IR would be well placed to evaluate and advise on technical economics matters, such as the efficiency of capex. In particular, it is unclear how the IR would address the 'benefit of hindsight' issue, which is likely to be material given the intangible nature of investments being made.

In summary, in relation to this criterion, the key consideration is the nature of industry characteristics which, collectively: (i) make the accurate assessment of capex efficiency hard; and (ii) give rise to differences between ex-post and ex-ante efficiency risk. Seen in the context of the proposals of each party, we rate the CAA's position as **'low'** on this measure and NERL's position as **'medium'.**

4.4.1 The effect on financial risk

In this section, we evaluate the proposals in relation to their effect on financial risk. As discussed in Chapter 2, the regulatory framework design can influence both the *'extent of risk'* and to *'whom it is allocated'*. This may, in turn, impact the WACC for the regulated company, if elements of the risk in question are systematic.

In our view, NERL's proposals do not affect financial risk, relative to the capex governance arrangements at RP2. However, the introduction of three targeted incentives under the CAA's proposals do give rise to a possible increase in financial risk (i.e. because there will be less certainty as to the capex costs that NERL will be able to recover). Here, our observations are as follows:

- Collectively, the delivery, efficiency and information incentives, allow the CAA to make adjustments to the cash flows NERL can generate from its investments (i.e. through adjustments to revenues or the RAB). In the case of the efficiency incentive, these adjustments are ex-post. Furthermore, because the assessments under the incentives in question are inherently 'subjective', under its proposals the CAA has considerable discretion as to whether, how often, and how materially, it might intervene. For example, in regulated industries where ex-ante capex allowances are appropriate, an ex-ante efficiency assessment provides a degree of transparency and certainty. That is to say, the 'measure' of efficiency is transparent and known in advance by investors; the 'method' for determining it is similarly clear; and so companies bear a 'knowable' risk of out or under-performing. Under the CAA's proposals, however, NERL has no way of knowing precisely 'how' the efficiency of its investments will be judged after the event, or the measure that will be used (i.e. all that is known is that the CAA will commission reports / assessments, then will make ex-post decisions). This increased latitude for the CAA to subjectively judge and intervene would seem to represent a clear increase in regulatory risk. Relatedly, it is well understood that such regulatory risk can be systematic, if the likelihood and impact of such behaviour is market correlated. We note, for example, that for this reason, the UKRN paper on the cost of capital states: *"the degree of discretion that can be applied by regulators should be limited, to no more than necessary to ensure consistency of treatment over time, which is necessary to promote the credibility of the regime and to manage investors' perception of regulatory risk"*.[31] Similarly, in recent times we have observed credit downgrades in regulated sectors specifically due to an increase in regulatory and political risk.[32] This, then, is not a 'theoretical' construct, but a very real cost to customers.

- The increase in risk from the CAA's proposals is all downside risk, because all the incentives are effectively 'penalty only'. This has different implications for the WACC and financeability compared to if there was a symmetrical increase in upside and downside risk (i.e. because there is evidence that investors expect to be compensated for skewness in returns).

- The penalty is capped for the delivery incentive, whereas the information incentive and ex-post efficiency review are only limited by NERL's capex e.g. only

'The degree of discretion that can be applied by regulators should be limited, to no more than necessary to ensure consistency of treatment over time, which is necessary to promote the credibility of the regime and to manage investors' perception of regulatory risk.' -

UKRN paper on the WACC

[31] *'Estimating the cost of capital for implementation of price controls by UK Regulators.' Wright, Burns, Mason and Pickford; UKRN (2018); page 4.*

[32] *e.g. Moody's downgraded Southern Water in September 2019, specifically citing regulatory and political risk.*

capex spent can be disallowed. Thus, the extent of risk exposure appears relatively 'open ended'.

- The CAA does not appear to have given any consideration to the consistency of the financial risk created by the incentives and the rest of the price control. For example, the above issues are not raised by the CAA in its determination of the WACC. Hence, its overall determination appears mis-calibrated.

Reflecting the above, we therefore rate the CAA's proposals as **'low'** in relation to impact on financial risk and NERL's as **'high'** (noting that 'low' implies a poor score).

In light of the issues noted here, the CMA may wish to carefully consider the extent to which discretionary ex-post interventions increase financial risk – and weigh this up, alongside other relevant costs and benefits. We would further suggest that attention should be paid as to the consistency of any such risk with the final WACC proposed for NERL.

4.4.2 Process costs

As discussed in Chapter 2, governance processes may come with: 'direct' costs, such as time to put together materials and engage with stakeholders; and 'friction' costs, which would arise if, for example, investments are delayed *because of the governance process itself* (i.e. putting to one side the 'delivery incentive mechanism', as this is captured within our first criterion).

Given that the CAA's proposed approach is 'more involved', it seems clear that it will have higher direct costs than NERL's proposed approach. For example, the increased role of the IR and the higher frequency with which issues such as efficiency may be considered (e.g. 'ad hoc reports' in addition to the potential for being included within 6-monthy SIP reports). The impact of this on customers may be mitigated by the fact that these 'administrative' costs will most likely be relatively low, compared to the value of the investments in question. However, as we noted in Chapter 2, given that NERL makes investment decisions 'more frequently' than in other regulated industries (and is subject to greater technological change and uncertainty) such direct process costs are likely to be higher for NERL in relative terms.

The CAA's proposed approach most likely results in higher 'friction costs' – and these could be more material. For example, in addition to the monetary value associated with producing information and engaging with stakeholders, 'more process' tends to mean decision-taking is delayed – in turn, delaying investment.

Overall, we rate the CAA's proposals as **'medium'** on this and NERL's as **'high'.**

5. Conclusions and recommendations

Whilst the governance proposals of the CAA and NERL have their respective strengths and weaknesses, in the round we find the CAA's perform more poorly against our evaluation criteria. The main weakness in the CAA's approach is that is places considerable weight on near-term efficiency (cost minimisation in particular) despite the fact that the features of the industry suggest customers are best served by avoiding the risk of underinvestment and unduly low quality levels – i.e. amongst other things, following from the overarching safety requirement. There is, therefore, a tension between the CAA's proposals and the broader regulatory design it applies to NERL. The regulator's proposals further give rise to increased financial risk, where the 'ex-post' nature of its assessments and interventions is especially problematic, given that it seems challenging to distinguish between the 'benefit of hindsight' and the actual efficiency and performance risk NERL would have faced on a forward-looking basis. Overall, the existing evidence base is limited, which means our assessment of both sets of proposals is primarily qualitative. Further information could, therefore, be developed to help inform the CMA's redetermination.

In this final chapter, we briefly summarise our main findings and recommendations. On the former, we draw on the detailed evaluation in the previous chapter - and evidence contained elsewhere in our report - to provide an overall evaluation of the governance proposals. We then identify some recommended areas for further consideration, as the CMA takes forward its redetermination of the RP3 price control.

5.1 Summary of our evaluation

Based on our evaluation against each criterion, as outlined in the preceding chapter, the following table summarises our evaluation of the respective governance arrangements of the parties. As can be seen, when the criteria are viewed as a whole, our judgment is that the CAA's proposals perform more poorly than NERL's. We consider the first criterion to be especially important, where the evidence suggests the

CAA's approach is misaligned with the industry's characteristics - and at odds with the regulator's own framework more broadly.

Table 7: Summary of relative evaluation

	CAA	NERL
1. Effect on the probability and consequence of inefficient investment		
1a) Evidence based and targeted		
1b) Appropriate balance of incentives		
1c) Evaluation accuracy		
2. Financial risk		
3. Process costs		

Source: Economic Insight

Drawing on our more detailed evaluation against the criteria contained in Chapter 2, our main findings are as follows:

- **The CAA's proposed introduction of three capex incentives represents a material change from previous price control approaches for air traffic control.** Whilst some change may be appropriate, there is a lack of evidence and framework to suggest the new proposals provide a better 'balance' of efficiency considerations than the status quo.

- **Similarly, NERL itself does not seem to have deeply reflected on the existing balance of risk to determine one way or another whether, and to what extent, change is appropriate at RP3.** However, as below, 'in practice' its proposals are a better fit to the industry.

- **Evidence on the industry's characteristics suggests that avoiding the downside possibility of preventing efficient investment / too low quality should be the primary goal.** For example, the overarching safety consideration, and importance of resilience. However, the CAA's proposals contradict this, by placing considerable weight on nearer-term efficiency, such as cost minimisation. Whilst NERL's proposals also place somewhat more weight on these shorter-term considerations relative to RP2, this is to a much lesser degree (i.e. because NERL is not proposing monetary incentive mechanisms). There is, therefore, a tension underlying the CAA's proposals and the broader regulatory framework.

- **The CAA's incentive proposals work on an ex-post basis (notably, efficiency) and incorporate considerable discretion. As such, they would seem to have a non-negligible impact on financial risk.** Here, a critical issue is that the CAA's approach risks conflating the 'benefit of hindsight' with actual efficiency

and the risk NERL faced on a forward-looking basis. This is particularly problematic, given the high proportion of NERL's investments that are 'intangible'. In contrast, NERL's proposals do not impact financial risk one way or another. The implications of this do not appear to have been duly considered for the broader price control design (e.g. for the WACC).

- **No governance arrangements are costless.** Whilst we have not quantified the likely processes costs, intuitively these would seem to be greater under the CAA's proposals.

Our review of the available evidence and proposals of the parties has also given rise to the following observations:

- **The CAA indicated that incentives would be an important aspect of the price control relatively early on in the development of its method for RP3, but was unclear as to whether it expected incentives to form part of capex governance**. At the beginning of the price control process (as part of the CAA's strategic outcomes document), the CAA set out the requirement for incentives – although this was in relation to NERL's Business Plan as a whole, rather than specifically in relation to capex governance. Very specific incentives, as part of capex governance, appear to have first arisen in the CAA's Draft Proposals, and then later it set out in its April 2019 'working note' that one of the principles guiding its proposals was that capex delivery, cost efficiency and information provision should be *financially incentivised.* The CMA may wish to consider the extent to which the CAA's original guidance aligns with its Final Decision – and the regulatory uncertainty that may have been created by any misalignment.

- **The CAA's proposals appear to be unfinished**. A key concern raised by the CAA's proposals is that they appear to hand the regulator significant discretion to make ex-post interventions. This is generally against good regulatory practice. Relatedly, however, the CAA's capex governance proposals still appear to be 'draft' (see appendix I of its final decision document). Furthermore, the CAA has not specified how incentives will be calculated in practice. For example, it has not been specified how the delivery incentive will be calculated, only that it will be capped at £36m. This would seem to further contribute to regulatory risk. Accordingly, the CMA may wish to consider the appropriate 'completeness' of the regulatory mechanisms, given that (in theory) the CAA's finalised proposals should be sufficiently detailed to prevent ambiguity.

- **The CAA has previously considered and rejected financial incentives on capex for NATS**. Specifically, at CP2, the CAA discounted this possibility due to the fact that: (i) NATS already faced strong opex and performance incentives; and (ii) the capital programme was hard to precisely specify.[33] In relation to the first issue, we note that opex continues to account for most of NERL's costs – so this rationale continues to apply. In relation to the second rationale, the CAA perhaps considers that, by applying an 'ex-post' approach, it can somewhat mitigate this concern. However, as we explain elsewhere, the very reasons that make a cost pass-through approach sensible in the first place in fact mean an ex-post approach is even more problematic.

[33] *See 'NATS price control review 2006-2010: CAA's Formal Proposals.' CAA (September 2005); page 3,19.*

5.2 Recommended issues for consideration by the CMA during its redetermination

Whilst we have set out our own assessment of the capex governance arrangements proposed by the CAA and NERL, this is an important topic on which the CMA will have to reach its own views. To be of further assistance, below we therefore summarise our take on the 'key governance issues' that we think might helpfully be considered further as the CMA progresses its thinking.

Table 8: Recommended issues for consideration by the CMA

Topic	Our recommended issues for consideration
Approach to evaluating governance arrangements	• Consider the 'problem' governance is seeking to solve in an industry where capex cost pass-through has been deemed appropriate in the first place. • Develop a framework within which the 'balance' between avoiding underinvestment / low quality can be traded-off against other efficiency considerations. • In practice, is there evidence that the current balance is inappropriate, in light of this?
Practical evaluation of the appropriate approach	• Consider evidence on industry characteristics and how this affects outcomes for customers in the event of underinvestment, versus other efficiency considerations. • Consider the likelihood / ability of governance arrangements to accurately assess the efficiency and effectiveness of capex. • Governance arrangements may increase financial risk – is this likely to be systematic? Has the WACC been calibrated accordingly? • Even if the increased regulatory risk is not systematic, given the negative skew to expected equity returns, have other elements of the control been calibrated appropriately, such that the central expectation is that an efficient firm will earn the WACC? • To what extent does the ex-post nature of the assessments and incentives suggested by the CAA matter? How much regulatory discretion and uncertainty is likely to arise? Can the benefit of hindsight problem be resolved, given the nature of NERL's investments? • What might the process costs be under the proposals? • Consider whether new evidence can be developed to inform the 'in practice' evaluation more robustly than has been possible to date.
Other considerations	• Whether the relatively late emergence of CAA imposed incentives accord with best regulatory practice. • Whether and to what extent NERL would have proposed the same plan, had it envisaged such mechanisms being applied.

Source: Economic Insight

6. Annex 1 – capex cost recovery mechanisms in other sectors

This annex reviews the precedent from: (i) Heathrow Airport limited (HAL); (ii) Network Rail; and (iii) water and energy sectors.

6.1 HAL

The high-level capex cost recovery mechanism in place for Heathrow Airport Limited (HAL) is cost pass through with governance.

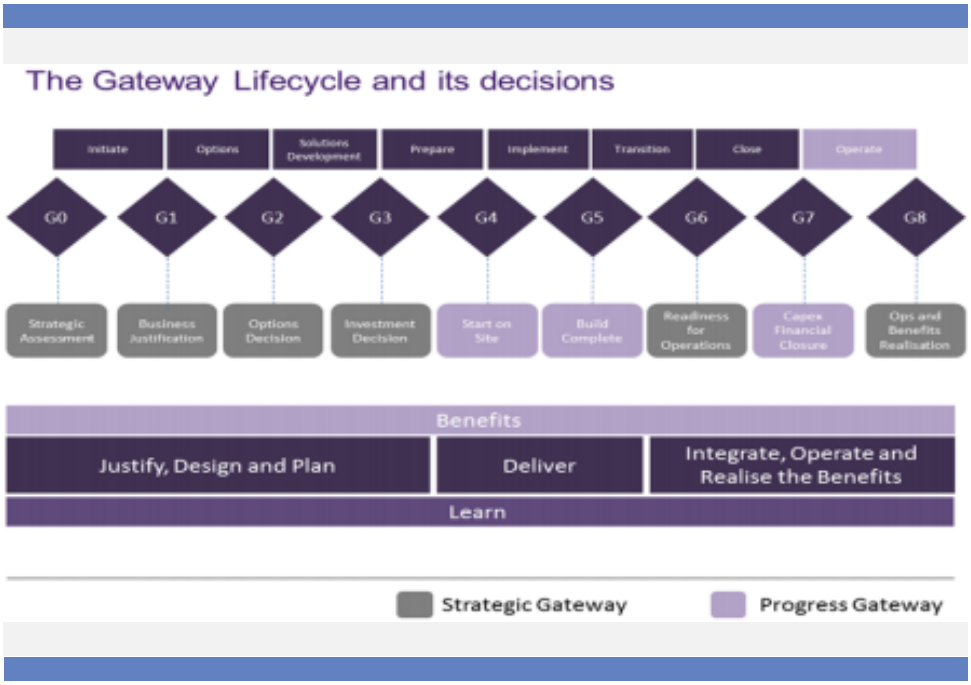
As part of its governance arrangements, HAL engages with:[34]

- The Independent Fund Surveyor (IFS), which reviews key capex decisions to ensure they are being invested effectively. The IFS reports on a monthly basis during development and delivery phases, and at gateways.[35]
- The Capital Portfolio Board (CPB), comprised of airlines and HAL representatives. The CPB manages and monitors the Q6 capex allowance envelope.
- The CAA, which has a mediator role and intervenes when HAL and airlines do not agree.

HAL's capital investment projects follow an eight-phase gateway process, as shown in the figure below. Capex in gateways 0 to 3 is known as 'development capex' and has an indicative allowance. After capex has passed gateway 3, it is classed as 'core capex' and has a fixed allowance. Core capex is more defined in scope, timeline, risk and cost than development capex,[36] and so is priced at the P50 level, whereas development capex is priced at P80.[37]

[34] *'Review of Heathrow Airport Q6 Capex Governance Framework' CEPA (2017).*
[35] *'Strategic Capital Business Plan' Heathrow (2014).*
[36] *'Strategic Capital Business Plan' Heathrow (2014).*
[37] *'Review of Heathrow Airport Q6 Capex Governance Framework' CEPA (2017).*

Figure 11: Capex projects gateway process



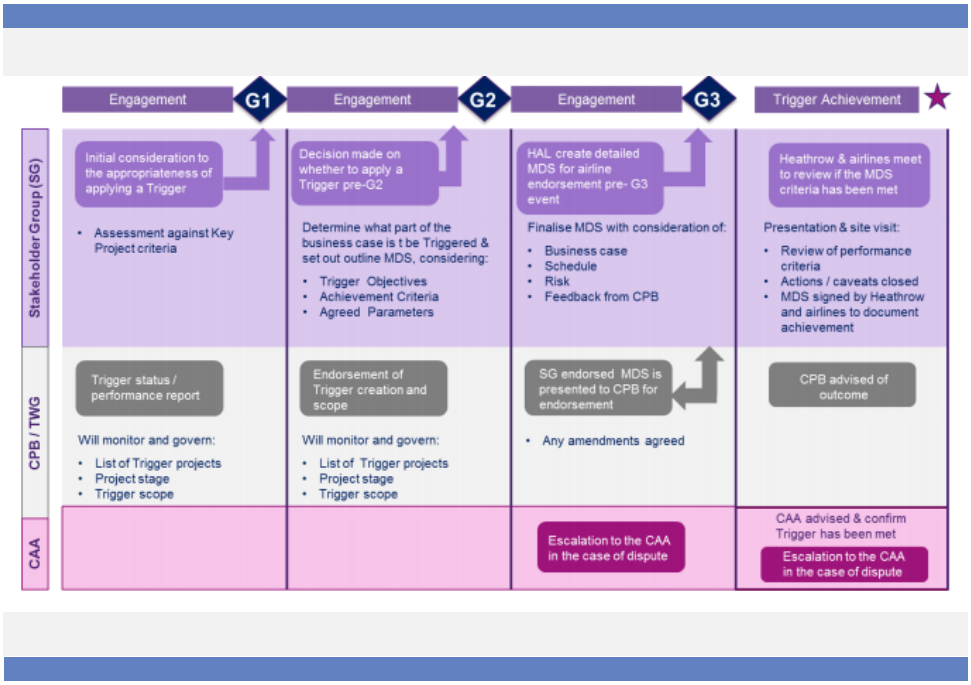
Source: 'Strategic Capital Business Plan' Heathrow (2014).

HAL's capex governance arrangements also include a range of targeted incentive features. These are as follows:

- The CAA sets an overall ex-ante envelope for capex, rather than an ex-ante assessment of costs for individual projects. However, it may conduct an ex-ante review of particular, high-value projects.[38]
- The CAA carries out an ex-post efficiency review of capex. If it deems capex is not efficient, costs can be disallowed from the RAB or deducted from the capex allowance.[39]
- A development capex incentive is in place to ensure that HAL only receives a return on development capex that has actually been used.[40]
- Triggers are set for key capex projects to incentivise HAL to deliver projects efficiently and on time. Heathrow must pay a rebate if the trigger date is missed.[41] The diagram below outlines stakeholder involvement in the trigger process at different gateways.

[38] *'Review of Heathrow Airport Q6 Capex Governance Framework' CEPA (2017).*
[39] *'Review of Heathrow Airport Q6 Capex Governance Framework' CEPA (2017).*
[40] *Available here: https://www.heathrow.com/company/company-news-and-information/economic-regulation/capital-expenditure*
[41] *'Q6 Capital Investment Triggers Handbook' Heathrow (2015).*

Figure 12: Trigger process



Source: 'Q6 Capital Investment Triggers Handbook' Heathrow (2015).

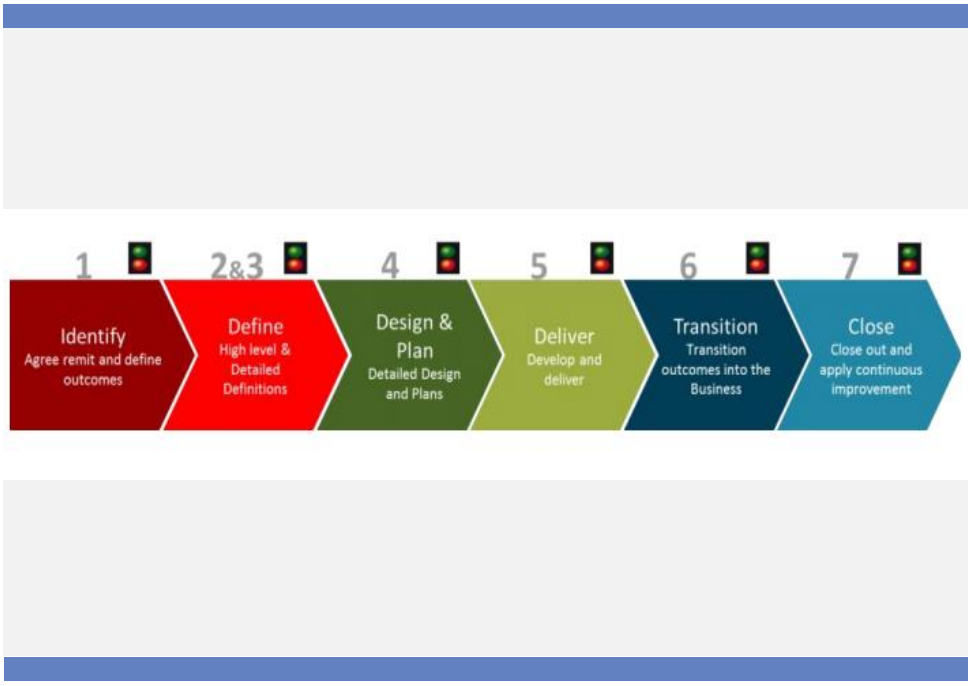
6.2 Network Rail

Network Rail manages its investment programmes through a seven-stage governance process, as shown in the following figure. In June 2018, Nichols undertook a review of the processes and controls in place for capex at CP6, at the request of the ORR.[42] Network Rail then published an action plan outlining how it proposes to meet the report's recommendations.[43] The recommendations, and hence Network Rail's actions, were organised around three themes:

- industry wide engagement;
- internal processes and control; and
- programme and portfolio management capacity development.

[42] *'Review of Network Rail System Operator CP6 Processes and Controls' Nichols (2018).*
[43] *'SO processes and controls for capital expenditure' Network Rail (2018).*

Figure 13: Network Rail's programme governance process

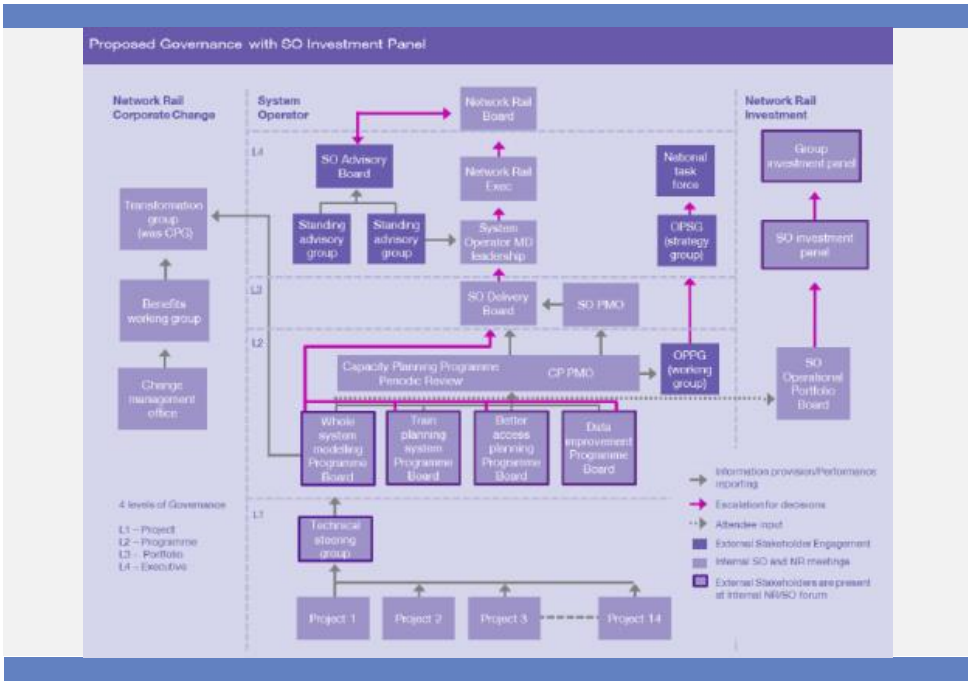


Source: 'System Operator Strategic Plan' Network Rail (2019).

As part of its action plan, Network Rail agreed to create a SO (system operator) investment panel, to increase transparency of investment decisions. This is shown in the figure below, along with Network Rail's current governance process. As can be seen, Network Rail has four governance levels:

- **Level 1: Project.** Individual capex projects, which are reviewed on a weekly basis by the programme manager, as well as by a Technical Steering Group.
- **Level 2: Programme.** Individual programmes, which are managed by four programme boards and overseen by the Capacity Planning PMO.
- **Level 3: Portfolio.** Capex portfolio as a whole, which is managed by the SO PMO and reviewed by the SO Delivery Board.
- **Level 4: Executive.** Advisory boards and executive members.

Figure 14: Network Rail's programme governance process



Source: 'System Operator Strategic Plan' Network Rail (2019).

Network Rail also engages with independent reporters as part of its governance process, who assess its (i) asset management; (ii) enhancement projects; (iii) data quality; and (iv) outputs delivery.[44] To assist the regulator in monitoring enhancement projects, independent reporters review "*Network Rail's ability to plan and deliver projects and programmes and to manage the portfolio of enhancements*".[45]

The ORR sets the criteria against which capex can be added to the RAB, and can decide whether to remove capex from the RAB. For example, if Network Rail does not reach desired performance levels, or breaches one of its licence conditions, the regulator can remove capex from the RAB.[46]

6.3 Water and energy sectors

As can be expected, the water and energy sectors do not have capex governance arrangements. This is because the characteristics of these industries lend themselves more to ex-ante targets with incentives. For instance, efficient costs are unlikely to change quickly in water and energy, since tangible assets, such as infrastructure, will be more prevalent in their capex than intangible assets.

[44] *Available here: https://orr.gov.uk/rail/economic-regulation/regulation-of-network-rail/monitoring-performance/independent-reporters*
[45] *Available here: https://orr.gov.uk/rail/economic-regulation/regulation-of-network-rail/monitoring-performance/independent-reporters/enhancements-independent-reporters-reports*
[46] *'Annual Report and Accounts' Network Rail (2019).*

7. Annex 2 – approaches proposed by the CAA and NERL

This annex sets out the timeline of the development of the CAA's and NERL's proposed approaches to capex governance at RP3.

7.1 The CAA's strategic outcomes – March 2017

In March 2017, the CAA published a discussion document related to the strategic outcomes it wanted to achieve from the economic regulation of NERL in RP3.[47] In light of its duties and responsibilities, the CAA set out three strategic outcomes:

- Outcome 1 – Effective **accountability mechanisms.**
- Outcome 2 – **Efficient prices.**
- Outcome 3 – Continued improvement in **service quality.**

Of most relevance to capex governance, the CAA stated under Outcome 1 it would be important (underlining added):

- "*that NERL keeps its customers properly informed and that these customers have suitable opportunities to make meaningful inputs into NERL's investment planning processes; and*
- *that NERL can be held accountable for the delivery of appropriate airspace change on time and to budget through regulatory interventions and incentives*".[48]

The CAA's discussion document further stated that stakeholders would expect a greater level of regulatory scrutiny and consultation than had occurred in the past. The regulator specifically stated that: *"airspace users have expressed a desire for greater involvement in investment decisions by NERL"*;[49] and noted that NERL's RP2 investment programmed changed materially in terms of scope and cost.

The document did not include setting out any specific proposals relating to capex governance at RP3. However, it did set out the CAA's view that:

- **More effective mechanisms for investment oversight** were needed at RP3 (which should be informed by a review of the effectiveness of existing arrangements).
- **Examples** of such mechanisms could include: new reporting requirements; additional consultations; financial incentives and / or licence obligations.[50]

---

47 *'Strategic outcomes for the economic regulation of NERL 2020-2024: Discussion document, CAP 1511.' CAA (March 2017).*

48 *'Strategic outcomes for the economic regulation of NERL 2020-2024: Discussion document, CAP 1511.' CAA (March 2017); page 6.*

49 *'Strategic outcomes for the economic regulation of NERL 2020-2024: Discussion document, CAP 1511.' CAA (March 2017); page 18.*

50 *'Strategic outcomes for the economic regulation of NERL 2020-2024: Discussion document, CAP 1511.' CAA (March 2017); page 19.*

7.2 The CAA's Business Plan Guidance – January 2018

In January 2018, the CAA published its Final Guidance to NERL in relation to the preparation of its Business Plan.[51] The CAA reaffirmed its previously set out three strategic outcomes (as summarised above) and identified the main theme for its guidance as **'effective accountability'.** Whilst the CAA saw the other two strategic outcomes as important, it viewed accountability as a way of achieving its second and third strategic outcomes, as well as accountability being integral to its longer-term vision for the industry.

In the following, we highlight contents of the CAA's guidance that are relevant to capex cost recovery and governance, organised around the chapter headings of the CAA's document.

7.2.1 Overarching expectations of NERL's RP3 Business Plan

In relation to stakeholder engagement and plan ownership, the CAA emphasised that NERL would be the owner of its Business Plan. However, it also encouraged NERL to engage with its stakeholders and pursue a consumer-driven strategy – and that this was consistent with the strategic outcome of effective accountability. Of relevance to capex governance, the CAA noted that NERL had the opportunity to **propose arrangements for shared governance** (sharing of decisions) and **financial incentives** (sharing of risks) to engage a wider community of stakeholders in managing and sharing those risks.[52]

The CAA also highlighted the challenge arising from the fact that there was a high degree of uncertainty regarding certain issues / activities that NERL might be required to undertake over RP3. Accordingly, the CAA's guidance stated that NERL should distinguish between 'core' and 'wider' requirements (in what the regulator terms a 'two-track' approach).[53] The CAA also stated that it would be helpful if NERL's plan could: (i) help stakeholders understand the nature of these uncertainties; and (ii) includes mechanisms for dealing with said uncertainties. This discussion did not, however, make specific reference to capex or capex governance.

7.2.2 Outcomes and outputs for RP3

The CAA emphasised that any outcomes and outputs developed within NERL's Plan should be in the context of maintaining and improving safety. Hence, of relevance to our discussion of regulators' statutory duties in Chapter 2, the CAA was reiterating the pre-eminence of safety.

The CAA also stated that NERL's Business Plan should: *"propose the incentive arrangements appropriate to support efficient and timely delivery for its customers and wider stakeholders"*.[54]

---

51 *'Guidance for NERL in preparing its business plan for Reference Period 3, CAP 1625', CAA (January 2018).*
52 *'Guidance for NERL in preparing its business plan for Reference Period 3, CAP 1625', CAA (January 2018); page 13.*
53 *'Guidance for NERL in preparing its business plan for Reference Period 3, CAP 1625', CAA (January 2018); page 15.*
54 *'Guidance for NERL in preparing its business plan for Reference Period 3, CAP 1625', CAA (January 2018); page 34.*

7.2.3 Costs

In its high level guidance on costs, the CAA recognised the trade-offs that might exist for NERL and noted the importance customers placed on outcomes (good operational performance, safety etc). However, it also recognised the potential tension between NERL itself providing assurance as to the efficiency of its cost programmes and it being well-placed to objectively determine their efficiency (i.e. NERL's own self-interest might hinder its objectivity).

Following from the above, the CAA stated that it was seeking an approach at RP3 that helped resolve tensions resulting from NERL's own commercial incentives, whilst recognising that NERL must maintain safety and be able to finance its licensed activities. In this context, and noting that the CAA was not specifically referring to capex, the regulator noted that it would be important to:

- get the **shared governance arrangements** between NERL and its customers right;
- get the i**ncentives** right; and
- have high levels of **assurance** for those who have to pay.

Of most relevance to capex and governance, the CAA specifically stated that: "*our thinking has evolved to emphasise more heavily the need for NERL's Business Plan to set out proposals for the governance and incentivisation of NERL's cost programmes".*[55]

The CAA also explicitly said that NERL's Plan should include: *"value-enhancing approaches to programme governance, including thought through proposals for shared governance, and financial incentives".*[56]

7.2.3.1 Guidance specifically relating to capex

In relation to capex specifically, the CAA noted that it was encouraged by the greater transparency, visibility and evidence of efficiency from NERL – particularly in NERL's 2018 SIP. However, the CAA noted that maintaining and improving the quality of information remained important objectives for RP3. The regulator also noted that airlines supported a greater role for them in determining NERL's investment programme, with capex subject to a specific approval and recovery mechanism, in which only investments consulted with the airspace user community and approved should be made.[57]

The CAA noted that NERL's view was that the role of the IR should not be extended beyond the current remit (verifying to the CAA and customers that NERL's reporting of progress is accurate). NERL was concerned that the IR was not well placed to be involved in investment planning and programme execution, which NERL considered to be its role. However, the CAA also noted that airlines were supportive of extending the IR's role. In its guidance document, the CAA was supportive of the airlines' views – stating that the IR's role was central to making shared governance an effective alternative to a high level of pre-specification for capital programme outputs and associated strong performance incentives.

---

55 *'Guidance for NERL in preparing its business plan for Reference Period 3, CAP 1625', CAA (January 2018); page 36.*

56 *'Guidance for NERL in preparing its business plan for Reference Period 3, CAP 1625', CAA (January 2018); page 36.*

57 *The CAA further rejected a proposal by IATA for a conditional price cap relating to capex.*

Following from the above, the guidance relevant to capex from the CAA was that RP3 presented an opportunity for NERL to build on the shared governance approach that was adopted for RP2, or to propose departures from it. In relation to the former, the CAA made it clear that it was looking for a strong commitment to shared governance between NERL and its customers, together with a well-designed future role for the IR function (or an alternative arrangement) during the course of RP3. The CAA further stated that the purpose of this should be to allow airlines to hold NERL more effectively to account for its management of the capital programme.

The document also contained the following more specific guidance for NERL to follow in its RP3 Business Plan:

- propose **well-designed plans for shared governance and assurance** for NERL's capital programme;
- indicate how its shared governance proposals would allow NERL to give due regard to non-participating stakeholders and wider environmental outcomes;
- confirm its **continued commitment during RP3 to high levels of transparency of cost and benefit information for participants** in shared governance in line with the Helios/Arup recommendations;
- **propose assurance mechanisms,** including independent review against best practice standards, around its broader programme management as well as around the specification and procurement of capital projects;
- in light of **differences between the incentives for capital and operating expenditure**, show how it will secure that programme governance will remain aligned with the interests of customers when capital programme options have operating expenditure implications; and
- demonstrate how its proposals will **provide meaningful accountability and protection to the economic interests of those paying for the programme** (in the absence of strong financial incentives for efficiency).

The CAA noted that if NERL proposed an alternative to shared governance, it expected to see an explanation of how NERL's proposals would work in practice to give customers and other stakeholders improved confidence in effective governance and protection, in the event that the programme were to evolve during RP3.

7.3 Exchange of views on NERL's Initial Business Plan

On the 25th May 2018, the CAA sent a letter to NERL with its early views of NERL's Initial Business Plan.[58] Whilst the CAA was encouraged by elements of the Plan, it also identified areas where it considered NERL had not delivered on its expectations of a high-quality plan. Of relevance to capex governance, this included a concern that NERL had not progressed proposals for 'shared governance arrangements'. The CAA specifically stated that: *"there appear to be very limited proposal to move shared governance forward and develop the role of the Independent Reviewer".*

On the 6th June 2018, NERL replied to the CAA's letter.[59] NERL commented that it had not only made improvements to governance over RP2, but had proposed further improvements for RP3. NERL further commented that:

[58] *'NERL's RP3 initial business plan' Letter from Richard Moriarty to Martin Rolfe (25th May 2018).*
[59] *'NERL's RP3 (2020 – 2024) initial Business Plan' Letter from Martin Rolfe to Richard Moriarty (6th June 2018).*

- Feedback from airlines and their trade associations made it clear that the level of engagement they have in NERL governance was far greater than they had with any other European ANSP.

- Extending customer and CAA/reviewer input beyond the levels proposed in its Plan would lead to a confusing mix of input and output regulation by both regulator and customers; and that this would seem to be inconsistent with the principles of arms-length regulation between commercial licence holder and regulator.

7.4 NERL's Revised Business Plan – October 2018

NERL published its Revised Business Plan in October 2018.[60] In relation to capex governance, NERL reiterated that its RP3 investment programme is complex and highly technical - and that it contains a number of critical interdependencies between implementation milestones. NERL also highlighted that the governance of the programme must be fit for purpose and proportionate, so as to reduce the risk of introducing delays and additional cost to its implementation. The details of NERL's proposals specifically relating to shared governance were set out in Chapter 9 and Appendix L of its Plan, as detailed below.

NERL stated it has already made a number of improvements to governance over RP2, which drew on the recommendations of the 2014 Arup and Helios Phase 1 Report.[61] Consequently, as part of its RP3 Plan, these improvements would be maintained. NERL's Revised Business Plan specifically lists these as follows:[62]

- Stronger management of the overall portfolio, with a clear focus on delivering agreed benefits to costs and timescales.

- Enhanced approach to supply chain management and strengthening of its approach to value for money.

- An enhanced approach to benefits tracking and management.

- Providing more detailed airspace and technology plans to describe the investment programme.

- Supplementing the SIP report with a formal report document providing transparent reporting against the detailed airspace and technology plans.

- Introducing a programme of customer deep-dive workshops on specific topics, facilitating more informal engagement and discussion to build understanding.

- A regular SIP update to airports and the wider stakeholder community through FASIIG.

- Welcoming the appointment of the CAA's IR to provide assurance to customers and regulators on the accuracy of reporting against the plan.

---

60 *'RP3 Business Plan 2020-2024' NATS (en route) plc (26th October 2018).*
61 *'NERL RP2 Capex Review, Arup and Helios Phase 1 Report' Arup and Helios for the CAA (January 2014).*
62 *'RP3 Business Plan 2020-2024' NATS (en route) plc (26th October 2018); page 74.*

According to NERL's 2018 SIP and 2017 customer survey, the above improvements were well received by customers. However, NERL's Revised Business Plan also included proposals above and beyond those implemented during RP2. In explaining this, NERL stated: *"we intend to retain and build on these developments to increase the quality and frequency of reporting, and will consult customers on investment or delivery options wherever possible. We also support an enhanced role for the independent reviewer. This approach will provide stakeholders with a transparent process, and clarity on how they can expect to be involved".*[63]

Accordingly, NERL's Plan also included the following additional elements beyond those implemented at RP2.

- An **annual update** to the C10 report to provide additional programme detail as it becomes available.
- **Continuation of the annual SIP process with full and interim SIP consultations each year,** including a formal report tracking updates against the C10 report together with a supporting slide pack.
- **Regular deep-dive sessions to cover subjects of key interest to customers,** most likely linked to the SIP timetable.
- **Six-monthly updates to airports and other key stakeholders** through the FASIIG meeting framework.
- **An enhanced role for the Independent Reviewer**, with regular quarterly review meetings based around NERL's portfolio dashboard, and continued engagement with the planning and SIP process. After the review of its portfolio dashboard, NERL will publish it to customers and the CAA.
- **Annual review with customers, as part of the interim SIP**, to discuss effectiveness of the process and lessons learned to improve the framework.
- **Customer consultation, wherever possible**, on investment or delivery options through the SIP process. NERL will continue to provide full justification for its decisions to ensure customers have assurance in the programme governance.
- **Pre-agreeing key programme milestones that will be tracked.** Where changes are required to these, outside agreed materiality thresholds, NERL will discuss these with customers in line with pre-defined engagement principles. NERL will also discuss any proposed redeployment of investment funds and if agreement cannot be reached, NERL will follow the agreed process of escalation.

NERL's Revised Business Plan also included that the Opex Flexibility Fund (OFF) will be governed and reported on via the SIP process. One of the benefits of this would be to facilitate efficient switching between opex and capex.

NERL's Plan also set out its governance proposals relating to the estimated 'benefits' for customers arising from its investment plan. Specifically, NERL identified six benefit types that it intends to track over RP3: safety; service; environment; cost efficiency; legislative compliance; and technical service risk. Its Plan included

[63] *'RP3 Business Plan 2020-2024' NATS (en route) plc (26th October 2018); page 74.*

governance arrangements to support: robust information on benefits; and business case development. In brief, key elements of the proposals were as follows:

- **Benefits delivery panels would be accountable for**: setting benefits targets: tracking the performance of projects / programmes; ensuring robust evidence; ensuring changes in status are subject to impact assessments; ensuring future initiatives are impacted assessed; and that there are robust methods for estimating benefits.

- **Portfolio Management Meetings** are held to share monthly updated from the benefit panel owners – and makes decisions that impact the portfolio (including such as new investments).

- The **Portfolio Investment Board** examines business cases that require greater scrutiny.

- The **Technical Review Committee** meets quarterly to review all Board level business cases.

7.5 The CAA's draft performance plan proposals – February 2019

The CAA published its RP3 Draft Performance Plan proposals for consultation in February 2019.[64] In relation to capex governance, the CAA noted that NERL had made improvements to its governance arrangements over RP2 with further improvements proposed for RP3 (including: providing users with more regular updates; and introducing an escalation process when NERL and users do not agree on proposed changes). However, the CAA was nonetheless of the view that NERL's proposed governance arrangements were insufficient to provide airspace users and other stakeholders with an appropriate degree of comfort with respect to its capex plans.

The CAA set out that it had commissioned the IR to review NERL's processes and to propose enhanced arrangements, from which a number of proposals had been identified, as follows:

- establishing a firm baseline for RP3 with clear scope, timescales, costs and benefits against which performance and other changes could be monitored and reviewed in RP3;
- that NERL should provide regular updates (every two months) to supplement the more extensive six-monthly updates it already provided;
- broadening the scope of independent oversight to encompass the content of NERL's capital programme and the accuracy of its reporting; and
- modifying NERL's licence to allow the CAA to opine on the content of the SIP as well as its form, scope and level of detail.

The CAA did not consider that its role should extend to giving an opinion on the content of the SIP during the reference period, as this would weaken the accountability of NERL for its capital programme. Taking various views into accounting (including the IR's and NERL's) the CAA summarised its capex governance proposals for RP3 as follows:

[64] *'Draft UK Reference Period 3 Performance Plan proposals' CAA (2019).*

Rather, the CAA's draft performance plan included the following proposals to strengthen the governance arrangements for NERL's capital programmes:

- **NERL to provide airspace users with timely and regular updates** on its approach to options appraisal, before it makes its final decisions to commit to major projects.
- If NERL and airspace users cannot agree on a preferred option, **an escalation process to senior stakeholders** (including the CAA, DfT (if related to airspace), airports (dependent on subject) and airlines) would be triggered.
- The **role of the IR to be enhanced to include assessing how well NERL has explained and justified its capital programme** in its SIP, as well as reviewing its reporting.
- The IR will report both to the CAA and airspace users, and these reports will (inter alia) inform the **CAA's decision on whether capital spending should be allowed in the RAB following the CAA's ex-post reviews of capital efficiency.** Adjustments would be made in the reference period following that in which the spending has been incurred. If NERL does not provide persuasive evidence that spending has been efficiently incurred, **the CAA may exclude such spending from the RAB.**
- If there are significant weaknesses in NERL's ongoing provision of information on its capital spending, any **overspend during RP3 will only be remunerated at its cost of new debt finance** (rather than the full WACC) during RP3 – even if it subsequently passes an efficiency test. As noted above inefficient spending may not be added to the RAB.

The CAA also noted that, subject to the above proposals and ensuring proper links with the AMS governance framework, it supported NERL's proposal to include the governance and reporting of the OFF within the SIP process.

7.6 NERL's response to the CAA's draft proposals – April 2019

In April 2019, NERL formally responded to the CAA's draft performance proposals.[65] In relation to capex governance, NERL raised significant concerns with aspects of the CAA's proposals. These were as follows:

- They would significantly **constrain NERL's ability to manage its capital investment programme**, as they introduce additional process / oversight for agreed programmes and restrict access to essential contingency funds.
- NERL supported the IR playing a wider role. However, it **opposed the idea that the IR should review efficiency on a six-monthly basis.** Specifically, NERL said that this was not in line with regulatory best practice – as efficiency could only be meaningfully assessed over longer intervals, so that costs can be viewed in the context of overall delivery (i.e. delivery also required a longer-term perspective).

[65] *'NERL's response to CAP1758: Draft UK reference period 3 performance plan proposals' NATS (12th April 2019).*

- NERL argued that the changes to the IR role **blurred the lines of accountability,** away from the core 'reporting' role on progress. NERL stated that, for it to be held accountable for the capex programme, a broad assessment of expenditure would be required at the beginning of RP4.

- NERL also objected to the CAA's implication that SIP approval would be needed before major programmes were included – and that contingency would be placed under the direct control of customers, through additional SIP governance. NERL argued that this would lead to **increased delay and costs, whilst also confusing accountabilities.**[66]

7.7 Update policy notes – April and June 2019

The CAA published a 'working note' in April 2019, followed by a 'draft note' in June 2019, on the policy and processes for capex governance.[67]

The April 2019 working note set out a decision tree to show what governance process and what funding source would be used under different circumstances. It also raised the potential risk that the capex governance arrangements would unintentionally transfer accountability from NERL to other stakeholders. In particular, it stated that:

"Another key risk is that the involvement of other parties in the governance process, particularly for AMS, may blunt the incentive for NERL (as the provider of en route and London Approach air traffic services, and sponsor of ACPs) and airports (also as a sponsor of ACPs) to take responsibility and accountability for their expenditure and decision making".[68]

Subsequently, the CAA noted that capacity and environmental targets and incentives may mitigate against NERL failing to invest sufficiently to maintain service levels. Furthermore, that potential new legislation may mitigate NERL being unwilling to make airspace change proposals (ACPs) that would otherwise beneficial.

In the June 2019 draft note, the CAA set out the principles that had guided its proposed capex governance policy – specifically:

- NERL's efficiently incurred capex will be added to its RAB.

- NERL should provide an appropriate level of information to enable airline users and other stakeholders to comment on the costs, options, delivery, benefits and risks associated with NERL's capex and requests for OFF funding.

- NERL decides its capex and is accountable for its costs, delivery and benefits. The one exception is that the AMS co-sponsors (CAA and DfT) can direct NERL to undertake certain AMS-related expenditure.

---

66 *'NERL's response to CAP1758: Draft UK reference period 3 performance plan proposals' NATS (12th April 2019); page 52.*

67 *'Working note: Capex and Airspace Modernisation Strategy (AMS) funds governance policy development', CAA, April 2019; and 'NERL capital expenditure (capex) and Airspace Modernisation Strategy (AMS) funds governance policy and processes – draft for stakeholder comment' CAA (June 2019).*

68 *'Working note: Capex and Airspace Modernisation Strategy (AMS) funds governance policy development' CAA (April 2019), para 27.*

- NERL should be financially incentivised to provide sufficient information to airline users and other stakeholders, to spend capex efficiently, and to deliver projects on time.

- The capex and funds governance processes should be easily understood and workable, avoiding unnecessary complication enabling a wide acceptance from all stakeholders.

- The processes shall evolve over time to reflect the feedback and experience of airspace users, other stakeholders and NERL on their usefulness and ease of use.

Broadly consistent with the working note, the June 2019 draft note set out a decision tree for governance processes and funding streams, along with identifying the potential unintended transfer of accountability and suggestions as to why the risk may be mitigated.

The June 2019 draft note also set out three capex incentives:

- **Ex-post efficiency review**. The CAA will commission an independent review of the cost efficiency of NERL's RP2 capex early in RP3. If the review identifies any expenditure as inefficient, the CAA may decide to disallow some or all of the inefficient spend. This will be achieved by a downwards adjustment to NERL's starting RAB for RP4. Similarly, the CAA will conduct a review of RP3 capex in RP4.

- **Information incentive**. For RP3, to encourage the provision of high-quality information as part of capex engagement under the enhanced SIP process, a financial incentive will apply. If there are significant weaknesses in NERL's ongoing provision of information on its capital spending, any overspend during RP3 would only be remunerated at its cost of new debt finance (rather than the full WACC), even if it subsequently passes an efficiency test. The incentive shall apply when there has been a serious failure in the provision of information to justify the overspend. The incentive will take effect through a one-off reduction in the starting RAB for RP4. The assessment shall be complementary to any CAA ex-post efficiency review of NERL's RP3 capital programme and the delivery incentive.

- **Delivery incentive**. A financial incentive will be introduced on NERL's delivery of its capex programme. This will involve a general assessment of NERL's capex delivery, supplemented by a focus on the delivery of specific milestones for programmes or projects that lead to important outcomes that benefit users. The financial incentive will take the form of a reduction in NERL's starting RAB for RP4. The amount of the incentive shall be capped, and is likely to be linked to NERL's return on equity on its capital investment in RP3. The assessment shall be complementary to any CAA ex-post efficiency review of NERL's RP3 capital programme.

The CAA also set out its view on the role of the IR. Specifically, that it would include:

  - assessing how well NERL has explained and justified its capital programme in its SIP;
  - reviewing the accuracy and timeliness of NERL's reporting in its SIP;

- tracking and assessing NERL's progress in delivering its investment plan and achieving the associated benefits; and
- reporting on the cost efficiency of NERL's capex.

7.8 The CAA's Final Decision – August 2019

In August 2019, the CAA published its Final Decision.[69] The CAA restated the significant capex change in RP2, whilst acknowledging that NERL had made incremental improvements to its SIP during RP2. However, the CAA nonetheless was of the view that: "*customer feedback during the RP3 preparations suggest that NERL is not yet providing airspace users and other stakeholders with an appropriate degree of comfort with respect to its capital expenditure plans*".[70]

Following from the above the CAA outlined its finalised proposals relating to capex governance. We summarise these in the following subsections relating to: governance processes; governance reporting; the capex delivery incentive; the capex efficiency incentive; the capex information incentive; and the role of the IR.

7.8.1 Governance processes

The CAA's Final Decision did not prescribe NERL's governance process for RP3, but did set out that a good governance process should include:

- engaging with its customers and other stakeholders in a meaningful, effective and timely manner;
- providing clear information of sufficient detail and quality;
- setting out analysis and options for delivering capital projects;
- setting out forecast and actual costs in a way that customers and stakeholders can understand;
- setting out performance outcomes and benefits in an open and transparent way for each programme; and
- clearly demonstrate how it has consulted stakeholders and taken account of their comments when reaching its decisions.

More broadly, the CAA's Final Decision sets out that NERL should **proactively seek engagement and agreement with any changes in the capital programme over RP3 with a broad group of users.**

More specifically, the CAA's Final Decision included a proposal to **modify NERL's licence** to require it to supplement its current annual and interim SIPs, with **quarterly updates** (based on the dashboard in its 2019 interim SIP taking into account users' comments), and to make clear that it needs to **consult users on new programmes and projects (with an estimated spend of over £10 million)** while they are still in the process of inception and options appraisal.

NERL's proposed escalation process would be adopted. Specifically, in circumstances in which NERL and airspace users cannot agree a preferred investment option (i.e. new investment or changes to an existing one), an escalation to senior

[69] *'UK RP3 CAA Decision Document, CAP 1830' CAA (2019).*
[70] *'UK RP3 CAA Decision Document, CAP 1830' CAA (2019); page 76.*

stakeholders would be implemented. Stakeholders including in the process are: the CAA, DfT (if related to airspace), airports (dependent on subject); and airlines.

There will be an 'agreed baseline' for capex at RP3, against which NERL's cost and delivery performance can be assessed. This is consistent with NERL's own proposals and informs the application of incentives (described in the subsequent subsections).

7.8.2 Governance reporting

NERL is required to produce a SIP document under its license (which reports on progress on capex delivery / performance). Thus, the CMA's Final Decision noted that this continues to apply. The scope of the SIP also includes reporting on key points and outcomes of any changes in governance engagement activities.

The CAA noted that NERL produces two SIP documents a year (annual and interim) and that in its Revised Business Plan it proposed to change the timing of these to January and July, which the CAA confirmed and agreed with in its Final Decision.

Reflecting changes to governance processes, the CAA indicated that going forward, SIPs should include: (i) updates on investment plans against the RP3 baseline; (ii) updates on NERL's delivery against milestones; (iii) a summary of changes made, the governance process followed, how decisions were made, the level of stakeholder agreement, and the justification for decisions; (iv) links to relevant materials, such as business cases; and (v) any proposed changes to milestones.[71]

In addition to the SIP, the CAA confirmed that NERL will provide quarterly dashboard updates – setting out update son the investment plan.

7.8.3 Capex delivery incentive

The CAA stated that it would introduce a capex delivery incentive. This would be based on an on a 'general assessment' of NERL's delivery performance, but with a focus on: (i) DP (en route) and DP (lower) technology changes to provide a common platform for the Swanwick and Prestwick centres; (ii) AD6 airspace change to increase capacity to Stansted and Luton airports; and (iii) LAMP airspace changes to modernise airspace in South-East England, in the context of the airspace change masterplan.

In practice, the IR will produce an annual report on NERL's capital expenditure delivery to inform the CAA's determination of whether / how to apply the incentive. The CAA's Final Decision does not contain much detail on the scope of said report, other than it will 'likely' include an overall assessment of NERL's delivery, in addition to delivery against specific milestones for the above priority areas. The CAA further set out that the incentive will be capped at a £36m penalty. It could take the form of either a revenue reduction, or RAB reduction, applied at the start of RP4.

The CAA further stated that, as part of applying the incentive, it would be prepared to amend specific milestones (used to assess deliverability) if there was sufficient evidence that the changes would benefit users (and that there was evidence of user

[71] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 133.*

support for said amendment). However, it nonetheless noted that its starting presumption was that NERL should deliver its RP3 investment plan "in full".[72]

7.8.4 Capex efficiency incentive

The appendices to the CAA's Final Decision describe the efficiency incentive as follows: *"before RP4, we will commission an independent review, or reviews, of the cost efficiency of NERL's RP2 and early RP3 capex. If the review(s) identifies any expenditure as inefficient, we may decide to disallow some or all of the inefficient spend. This will be achieved through a downwards adjustment to NERL's starting RAB for RP4".*[73]

The CAA further suggests that the IR will be the responsible party for assessing the efficiency of NERL's capex for the purpose of determining whether to apply the incentive. However, the CAA is unclear as to exactly 'how frequently' the IR would undertake these assessments, referring to them in the context of describing 'ad-hoc' reports to be provided by the IR (but we also note that the IR will produce six monthly reports on the annual and interim SIPs respectively, the scope of which could include efficiency).[74]

7.8.5 Capex information incentive

Under the information incentive, the CAA proposed that any over-spend by NERL during RP3 would only be remunerated at the cost of new debt, rather than the WACC, if there are: *"significant weaknesses in NERL's ongoing provision of information on its capital spending programmes".*[75]

The CAA further set out that the incentive would be used when it considered there were 'serious failings' in the provision of information to justify an overspend either at the project or programme level, or on capex in totality. The CAA defined a 'significant failure' as being where NERL have offered no reason for an overspend, or had provide information at 'too high' a level to make an assessment of why the overspend occurred. As per the efficiency incentive, the financial impact of the information incentive would be in the form of a one-off reduction in revenues or the RAB at the start of RP4.

7.8.6 Role of the IR and frequency of reporting

The CAA's Final Decision also set out its views on the role of the IR. Here, the CAA determined that the IR's role should include the following:

- consider NERL's process for user engagement in its capital governance arrangements;
- assess how well NERL has explained and justified its capital programme in its SIP;
- review the accuracy and timeliness of NERL's reporting in its SIP;
- track and assess NERL's progress in delivering its investment plan and achieving the associated benefits; and

[72] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 127,*
[73] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 127,*
[74] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 129,*
[75] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 127,*

- report on the cost efficiency of NERL's capex.

In terms of reporting by the IR, the CAA's Final Decision set out that the IR shall provide:

- **Regular reports** on each SIP and interim SIP. The report on the annual SIP (provided by NERL in January each year) shall include a report on NERL's capex delivery during the year (see above). This will contain both a general view on NERL's capex delivery on its whole capital programme, and a report on particular projects or programmes that are a particular focus of the RP3 delivery incentive.

- **Ad-hoc reports** on various aspects of NERL's capital programme and performance, for example the efficiency of NERL's spend on a particular programme, or its approach to securing that its capex delivers benefits in line with business cases. [76]

[76] *'UK RP3 CAA Decision Document: Appendices CAP 1830' CAA (2019); page 129.*

7.10 Summary of the finalised positions of NERL and the CAA

Bringing the above together, in the following table we summarise the final relative positions of the CAA / NERL relating to capex governance, including a comparison of these to the arrangements in place at RP2.

Table 9: overview of final positions in relation to capex governance

Governance element	Status quo	Relative positions of CAA / NERL	
	RP2	CAA Final Decision	NERL (Revised Business Plan / response to Final Decision
Governance processes	*Note: RP3 proposals include these processes in addition to those listed right.* Annual and interim SIP. IR role is to assess the accuracy of NERL's reporting (as stipulated in licence condition). Stakeholder engagement around SIP (including updates through FASIIG meetings).	*Note: these are 'over and above' the RP2 processes (shown left).* Proactively engage with broad user group on any programme changes over RP3 (wherever possible). Mandatory requirement to consult users on schemes >£10m. Frequent engagement with key stakeholders (timely). Escalation process (as per NERL). Enhanced role for the IR – including assessing efficiency, delivery and info quality to inform incentives – and reporting back to CAA. Agreeing baseline against which RP3 performance can be assessed. Pre-agreeing key programme milestones that will be tracked. Changes to milestones subject to approval.	*Note: these are 'over and above' the RP2 processes (shown left).* Proactively engage with broad user group on any programme changes over RP3 (wherever possible) Regular deep-dive sessions to cover subjects of key interest to customers Six-monthly updates to airports and other stakeholders through the FASIIG framework. Escalation process. An enhanced role for the IR, with regular quarterly review meetings based around NERL's portfolio dashboard Annual review with customers, as part of the interim SIP. Agreeing baseline against which RP3 performance can be assessed. Pre-agreeing key programme milestones that will be tracked.
Governance reporting	Annual SIP and interim SIP.	Annual SIP; interim SIP; and quarterly reporting dashboard.	Annual SIP; interim SIP; and quarterly reporting dashboard.
Incentives			
Delivery incentive	Does not apply	IR assesses delivery on a six-monthly basis (i.e. an annual report on both the annual and interim SIP). Penalties capped at £36m (applied as either a reduction in revenue or RAB at start of RP4).	Does not apply.
Ex-post efficiency incentive	Does not apply (the CAA has previously commissioned efficiency assessments of NERL's proposed capex at prior controls. These have been informed by assessments of the efficiency of capex at preceding price controls. However, there has not been any mechanism that applies financial penalties to previously incurred capex after the event).	The CAA refers to commissioning a review / or reviews of efficiency. In addition, the CAA suggests IR assesses ex-post efficiency of capex on an ad-hoc basis, and then advises the CAA. Efficiency assessment potentially also six-monthly, if included within scope of the IR's annual and interim SIP reports. CAA determines whether to exclude from the RAB.	Does not apply (RP2 status quo persists).
Information incentive	Does not apply (although licence conditions require NERL to provide certain information).	Remunerating any capex overspend at the cost of debt, rather than the WACC, where the quality of information provided by NERL is deemed insufficient (applied as either a reduction in revenue of RAB at start of RP4).	Does not apply (RP2 status quo persists).

Source: summarised from CAA / NERL RP3 publications

Following from the above, it is important to note that the three 'incentive mechanisms' the CAA is proposing for RP3 are 'new' and have not been previously applied at RP2, or any other preceding control.

It has always been the case, however, that user views (including the sharing of information) and an assessment of capex efficiency, have informed the shape of NERL's investment plans and the CAA's assessment thereof. Indeed, our understanding is that there has always been a 'consultation requirement' for investment to be added to NERL's RAB on a forward-looking basis. In relation to the efficiency of NERL's proposed capex, the CAA has consistently considered and assessed this when evaluating NERL's Business Plans (i.e. again, considering capex on a forward-looking basis, albeit informed by backward-looking reviews of efficiency over prior controls). In the following we briefly expand on our understanding of the existing arrangements of relevant to the efficiency and information incentives (there are no prior arrangements relevant to the delivery incentive).

7.10.1 Previous approaches relevant to the efficiency incentive

NERL's licence includes conditions that require it to show how efficiency has been taken into account in developing its proposals. For example, Condition 10(9),b states that in relation to technology and airspace programmes, NERL's SIP must address: *"how the programme furthers airspace and ATM modernisation in respect of the key performance areas of safety, capacity (as measured by ATFM delay), the environment (as measured by flight efficiency and enabled fuel saving) and cost efficiency".* NERL's general obligations are also relevant, where Condition 2(2),b refers to NERL's obligation to make *"the most efficient overall use of airspace".* Logically, therefore, NERL has always been required to ensure it considers the investments it proposes to be 'efficient'.

Relatedly, the duties of the CAA, as contained in the Transport Act, obviously require it to take efficiency into account when evaluating NERL's Business Plans / setting price controls. For example, the CAA's general duty to *"promote efficiency and economy".*

Consistent with this, going into previous price controls, the CAA has always placed weight on an assessment of the efficiency off NERLs capital programme, alongside the assessment of its operating costs. However, to be clear, the question the CAA has been considering is whether NERL's proposed investment for the control in question is 'efficient' and, therefore, should go ahead. Historically this has been supported by externally commissioned reports, which have considered the efficiency of the investment proposed for the price control in question. Such reports have also been *informed by* more backwards-looking reviews of the investment of capital incurred in prior controls.

For example, in assessing NERL's proposed capex plans for RP2, the CAA commissioned Arup and Helios to provide an independent report. This included a consideration of efficiency. In addition, the assessment of the efficiency of the RP2 proposals was 'informed by' a backwards looking assessment over CP3. Specifically, the report states: *"Arup, together with Helios, were appointed by the CAA to undertake an independent review of capital expenditure plans developed by NATS (en route) plc (NERL) for the next regulatory reference period (RP2), taking into account NERL's*

delivery of its capital expenditure plan during the current regulatory control period (CP3)".[77]

7.10.2 Previous approaches relevant to the information incentive

As above, our understanding is that there has been a 'consultation test' that informs whether capex should be added to NERL's RAB in the past. Specifically, Condition 10(14) of NERL's licence states that: *"the form, scope and level of detail of the plans referred to in this Condition shall be as reasonably approved by the CAA and shall take into account the views of Users consulted in accordance with Condition 16".* Note, that this means NERL itself is required to take stakeholder views into account in proposing investment in the first place. Various other Licence conditions require NERL to share information that (either explicitly or implicitly) allows stakeholder views to be taken into account. These include: Condition 10(15); Condition 11(4); and Condition 17. Similarly, various duties of the CAA set out in the Transport Act (e.g. to satisfy user requirements, take into account interests of other relevant persons) seem to be consistent with it taking evidence on the views of users (and thus stakeholder engagement) into account when evaluating NERL's Business Plans.

7.10.3 Summary of key changes relative to RP2

Based on the above, the incentive mechanisms proposed by the CAA are 'new' (i.e. did not apply at RP2). In fact, they seem to represent a material departure from prior approaches. The key points seem to be as follows:

- The CAA's proposed **delivery** incentive is new in its entirety. Nothing similar applied at RP2, or prior price controls.

- When determining whether to allow investment at any given price control (e.g. RP2) **efficiency** has always been an important consideration. Thus, the CAA's view of efficiency has always implicitly been a factor in its determination of whether and 'how much' investment should be included in the RAB. However, what was being assessed was 'new' proposed investment for the price control in question (i.e. it was forward-looking). For example, as noted above, the assessment of the RP3 investment plan was *informed by* an assessment of efficiency at RP2. In contrast, the efficiency incentive proposed by the CAA at RP3: (i) allows for the possibility for this assessment (and incentive) to applied to investments already made; and (ii) creates a formal link between that assessment and (retrospective) allowed revenues / the RAB.

- When determining whether to allow investment at any given price control (e.g. RP2) there was a requirement that stakeholder views were taken into account. By definition, this means that **information** necessary to facilitate that must have been shared. However, unlike the proposed information incentive, this merely helped determine 'whether' new investment should proceed (i.e. therefore be added to the RAB) in the first place. In contrast, the information incentive proposed at RP3: (i) allows this assessment to apply to investment already made (because the assessment can be backwards looking); and (ii) imposes a direct

[77] *'Civil Aviation Authority NERL RP2 Capex Review Arup and Helios Phase 1 Report.' Arup and Helios; (2014); page 1.*

financial incentive element, by way of a reduction in the allowed return to the cost of new debt.

8. Annex 3 – further analysis of intangibles

Chapter 3 of this report set out an analysis of the extent to which NERL's investments were more 'intangible' focused, relative to other regulated industries. We further explained that, in practice, our analysis (based on accounting data) might actually understate just how 'intangible intensive' NERL's investments are.

Specifically, we understand from NERL that accounting classifications categorise some of its intangible elements as being tangible – that is, some assets which rely on *both* hardware and software are accounted for entirely as tangible assets (despite having large software components). To illustrate the impact of this, NERL provided us with a more granular breakdown of its tangible / intangible assets over RP2. The table below provides the breakdown, based on the treatment of assets consistent with their accounting classifications. As can be seen this indicates 58% of NERL's assets are intangible (i.e. similar to our reported result in Chapter 3 of 60%).

Table 10: RP2 intangible / tangible asset split

External Programme	Intangible Assets (£m)	Tangible Assets (£m)	% Intangible Assets
Airspace	44.8	0.7	98%
DSESAR	352.8	208.8	63%
Tech Op Sust & Res	14.1	76.1	16%
Dom En Route Op Serv Enh	0.8	0	100%
FM	0.3	21.6	1%
IS	26.9	16.6	62%
Oceanic	16.5	2.0	89%
Contingency	0.2	0.1	67%
TOTAL	**456.4**	**325.9**	**58%**

Source: Email from NATS

However, if adjustments are made, such that assets that have both 'tangible' and 'intangible' dimensions are treated as such (i.e. rather than being classified entirely as tangible, their treatment reflects the fact that certain investments incorporate elements of both), the figures change quite materially. The adjusted figures, provided to us by NERL, as shown in the following table. As can be seen, after adjustments, intangibles account for nearer 70% of the company's investments.

Table 11: RP2 intangible / tangible asset split – post adjustments

External Programme	Intangible Assets (£m)	Tangible Assets (£m)	% Intangible Assets
Airspace	44.8	0.7	98%
DSESAR	407.2	154.4	73%
Tech Op Sust & Res	47.2	43	52%
Dom En Route Op Serv Enh	0.8	0	100%
FM	0.3	21.6	1%
IS	32	11.5	74%
Oceanic	18.2	0.3	98%
Contingency	0.2	0.1	67%
TOTAL	**550.7**	**231.6**	**70%**

Source: Email from NATS

WE MAKE ECONOMICS RELEVANT

Economic Insight Limited

125 Old Broad Street
London
EC2N 1AR
0207 100 3746
www.economic-insight.com