Water today, water tomorrow

Capex bias in the water and sewerage sectors in England and Wales – substance, perception or myth? A discussion paper

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About this document

This document considers the concept of capex bias. This is the view that the water and sewerage and water only companies in England and Wales have an inappropriate preference for expenditure on capital assets (or 'capex') over day-to-day operational expenditure (or 'opex').

The concept of capex bias is important to us. If it is real, then the companies are not developing the best solutions for their customers and the environment. This means that they are not spending customers' money to deliver the right outcomes in the most efficient way.

Through the analysis set out in this document, we aim to understand if a problem exists, and what the potential causes might be. We also consider what we have heard from stakeholders on the issue. We recognise that this is a complex matter. It involves our regulatory approach, and the actions and reactions of the company management and their owners. We explore whether the problem is real or perceived.

We identify that different degrees of bias potentially exist under different circumstances. Some of this is linked to the regulatory framework. But it is unclear how the companies are reacting to this. We also find that the companies and the wider environment are likely to be influencing investment preferences. We explore potential options that we could consider in the future and invite your views on how these could work.

This is one of a series of discussion papers on a specific aspect of price setting. In 'Beyond limits – how should prices for monopoly water and sewerage services be controlled?', which we published in July 2010, we explained how and why we are reviewing the way we set price controls.

The aim of these discussion papers is to obtain stakeholders' views and to inform more debate on approaches and tools as our future price limits project progresses. They are not intended as a definitive statement of our views or as a formal consultation. Details of how to engage in the discussion are set out in chapter 5.

We will use the feedback we receive on these documents to inform our overall approach to price setting. We will publish a final statement describing that framework in spring 2012, before work on the next round of price limits begins. We expect to publish our methodology for consultation in autumn 2012 and our final methodology document in early 2013.

Contents

Key messages

- If 'capex bias' in the water and sewerage sectors is real, then the companies are not developing the best solutions for their customers and the environment. This means that they are not spending money on sustainable and efficient solutions to deliver the right outcomes.
- Anecdotal evidence suggests that the complexity of the current regulatory framework, when taken with other influences, may mean that the companies are not reacting to our incentives in the way that we intended them.
- Financial modelling suggests that our regulatory incentives may cause the companies to prefer either operating or capital expenditure depending on their individual circumstances.
- Regulatory incentives include reputational, process and financial incentives; it is not clear that the incentive package as a whole is systematically biased towards capex.
- But the incentives to achieve financing efficiencies and regulatory capital value (RCV) growth are having an important influence in both business planning and delivery.
- Other drivers that are likely to be significant include:
  - company approaches to risk management and control;
  - company engineering culture;
  - investor interests; and
  - the company reaction to potential enforcement action and the specification of outputs by regulators.
- Future options must:
  - have a clear aim;
  - be proportionate to that aim;
  - be clear and transparent;
  - minimise unintended consequences; and
  - be robust to change and adaptable.

1. Introduction

Most people in England and Wales receive their water, sewerage or water and sewerage services from one of 22 licensed regional monopoly suppliers. Only very large business customers are able to choose the company that supplies these services.

Since the water and sewerage sectors were privatised in 1989, it has been our role to regulate the monopoly companies. Since 2003, we have also regulated water supply licensees. We have a legal duty to protect consumers' interests, wherever appropriate by promoting effective competition, while ensuring efficient companies can carry out and finance their functions.

One of the ways in which we comply with our legal duties is to review and set price limits based on an investment and service package that customers receive from their water company. We currently set price limits every five years. We completed the last review in November 2009 for the period from 2010 to 2015.

In the absence of competitive market pressures, our regulation aims to create a framework that incentivises the companies to make the best choices about how to deliver the right outcomes for customers and society. This means that assessing and forecasting capital and operating costs forms a critical part of any price review. Typically, price reviews involve assessments that include the:

- scope of capital and operating expenditure; and
- unit costs associated with them.

We define **capital expenditure (or 'capex')** as expenditure on capital (that is, productive capacity) with a useful life that extends beyond the accounting year. It may include expenditure that will enhance or maintain productive capacity. We define **operating expenditure (or 'opex')** as expenditure on the operation of capital (in order to provide goods or services).

Some of our stakeholders (mostly water companies but also some environmental groups) have told us that the sectors exhibit a 'capex bias'. By this, they mean that the companies prefer to incur capital rather than operating expenditure when it is inappropriate for them to do so, or when it does not offer the best solutions for customers or the environment.

The question of whether (and why) there is a capex bias matters because – if one exists – then it could work against the companies choosing the most efficient ways of

delivering the outcomes that their customers and society value. It could also imply that investors may be investing in unsustainable solutions.

Since privatisation, investors have put more than £90 billion into the sectors and have earned a fair return. They tell us they want a continued stable, transparent and fair return over the long term. They value the regulatory framework because it provides protection from uncertainty and risk. So, they want sustainable returns, which means their investment needs to go into sustainable assets and solutions. If customers perceive that their money is being invested in the wrong assets and solutions, then the sectors will begin to lose legitimacy with them and with wider stakeholders.

A capex bias occurs where capital expenditure options are chosen inappropriately over operating expenditure. Our regulatory framework could create or contribute to a capex bias if it meant that a regulated company could gain more through our incentives from increasing capex than from increasing opex. Most obviously, this could occur if the company gained more financially as a result of pursuing capex rather than opex solutions. But the reputational and procedural incentive properties of our regulatory framework could also play a part.

We use incentives to encourage the companies to generate outcomes that customers and society need, want and are willing to pay for, and to do so efficiently. We do this in part by setting price limits so that the companies will be able to recover what we consider to be the reasonably efficient costs of supplying regulated services.

If the companies are less efficient than we expected when we set price limits, they will not recover all of their costs from their customers. But if they are more efficient than we expected, we allow them to retain a proportion of the savings they have made before passing them on to customers.

Some stakeholders have suggested that the way in which we use our incentives creates or exacerbates a capex bias on the part of the companies. In particular, they have suggested that the incentives to cost assessment and cost recovery our approach creates cause them to favour capex solutions.

In this document, we review the current mechanisms for cost assessment and cost recovery to enable us to understand better the incentives they create for capex and opex. We also examine how the companies understand the incentives they face and translate them into their behaviour. To do this, we draw upon recent meetings we have had with the companies. We also summarise wider stakeholder views and consider briefly if other sectors have explored this issue.

We welcome your views on any of the issues discussed in this document by the end of June 2011. In particular, we would welcome your views on the questions outlined in chapter 5.

1.1 Categories of expenditure

When discussing capex bias, it is important to remember that in our regulatory approach, we do not treat all expenditure in the same way. While we treat all operating expenditure the same, we divide capital expenditure into four categories.

- **Opex.** This is the expenditure on the operation of capital and is recovered from customers in the year in which it is incurred. Opex can be both one-off and ongoing. The former is expenditure that occurs in just one year and is not repeated, whereas the latter is repeated in future years. The difference between these categories is important as the impact on individual incentives will depend on which year the expenditure is incurred in the five-year period.

- **Below-ground maintenance.** 'Maintenance' refers to expenditure that is required to maintain existing levels of service. For below-ground assets, this is treated in a similar way to opex. It is recovered on a pound-for-pound basis according to average expenditure over 15 years.

- **Above-ground maintenance.** This is expenditure required to replace the above-ground assets when they reach the end of their lives. This is funded in price limits as part of the depreciation charge. We expect the value of the charge submitted in the companies' business plans to be equivalent to the expected expenditure over a certain period of time. Any investment in this category is added to the regulatory capital value (RCV), but is effectively replacing an old asset that is no longer operational.

- **Below-ground enhancement.** 'Enhancement' is an addition to the asset base that is not replacing any existing asset but that will enhance the quality of service. This type of investment is added to the RCV but not depreciated. It permanently increases the RCV (on which a company earns a return in perpetuity).

- **Above-ground enhancement.** This is similar to the below-ground enhancement expenditure outlined above. The difference is that these assets are separately identifiable rather than being part of an underground network. These assets are allocated expected lives and are depreciated.

1.2 Links to other areas of the future price limits project

Our work on capex bias is part of a larger work stream on cost assessment and cost recovery. This in turn feeds into our work on future price limits. We want to develop future approaches for cost assessment and cost recovery within price limits. We also want to understand the impact of possible approaches on any capex bias, and will take this into account in the approach to our price setting methodology.

1.2.1 Incentives

The way we assess and recover costs create financial incentives that affect a company's behaviour. There is also the possibility that procedural and reputational incentives are influencing company behaviour and creating a bias. It is important to note that some of the incentives that the companies face may not be the direct consequence of our regulatory framework. So, it is possible that changes in our framework may not be the best way to influence such incentives. But we should understand the way in which our incentives will interact with these wider drivers and their cumulative effect on company behaviour.

1.2.2 Outcomes

The way in which the outcomes that are included in price limits are determined will affect the approach to cost assessment and cost recovery. This could contribute to capex bias. The way in which we incentivise delivery of outcomes could also do this.

For example, our existing approach – which holds the companies to account for delivering particular outputs – could limit company choice. Nor is it necessarily always aligned to outcomes. The costs allowed for and included in price limits, and our focus on outputs, could incentivise them to focus on delivering schemes that reduce their exposure to the downside of our incentives.

1.2.3 Customer engagement

In our work on customer engagement, we are considering incentivising the companies to engage with customers and explore the best ways to deliver the outcomes that they – and wider society – value. Many of these will be opex based. If the companies perceive that the regulatory incentives they face are favour capex rather than opex, this could influence the approach they choose.

1.2.4 Innovation

We want a regulatory framework that encourages and helps to bring about innovation where appropriate. At present, most innovation expenditure is categorised as opex. So, if a capex bias exists or is perceived, this could act as a barrier to innovation.

1.2.5 Cost of capital and risk mitigants

At a price review, the way in which we assess company costs and allow the companies to recover efficient costs from prices for regulated services during the price control periods affects the allocation of risk between companies and other stakeholders (notably customers and wider society). We expect to allocate risk to the party best placed to manage it. We must also consider the overall balance of risk in the price setting package overall in the judgements we make when we set price limits. These judgements include:

- our approach to setting cost allowances;
- the incentives within the price setting package;
- how investors are remunerated for their exposure to risk; and
- the mitigation mechanisms we use to deal with uncertainties.

2. Understanding capex bias

1. If we are to understand what any capex bias may mean for future price limits, it is important to distinguish between the different forms of bias. This is because they may have different implications and underlying causes.

2. We do this by considering what we have heard from the companies and other stakeholders. We use this information to identify the potential drivers of capex bias before identifying forms of bias or behaviours that the drivers create. Finally, to help understand capex bias we link the forms of bias to observable indicators, including analysis of the regulatory framework.

2.1 What the companies have told us

3. As part of the work we have carried out in our future price limits project, we met with each of the monopoly companies we regulate. This was so that we could understand their views on the project as a whole, and on any particular issues. We also asked them to identify any ideas they had that may be relevant to this project.

4. In each case, we asked the companies specifically for their views about possible capex bias. This chapter summarises their views. More detailed information is available in appendix 1.

5. Overall, we received mixed messages from the companies. Some said that there is a real bias (often for different reasons); others considered that it was only a perception they had.

6. About half of the companies stated clearly that they did not perceive there to be a bias towards capex within their own decision-making. Usually, they based this on the view that they have developed their business plans using cost-benefit and whole-life cost techniques.

7. A small number of companies suggested that the perception that a bias exists is becoming 'self-fulfilling' in the sectors. Indeed, one company said that, "to an extent, it doesn't matter how **theoretically** balanced the regime is, it matters how companies **perceive** it to be."

8. We have outlined the key themes that the companies raised below.

2.1.1 Regulatory framework and economic incentives

9. The companies were divided between those that think our regulatory framework impacts on decision-making in a way that creates some degree of bias, and those that do not. The area they raised the most was the impact of expenditure on profits, and the fact that capex earns a return while opex does not. A small number of companies mentioned that this influences how they account for costs, including their capitalisation policy. The companies also discussed the impact of reputational incentives, such as the relative efficiency assessment for opex. They argued that increasing opex could see them perform less well in our relative efficiency assessment, moving down our 'league table', which we published each year until 2009.

10. The companies also raised the complexity of our overall regulatory framework as an issue. Several mentioned that the relative simplicity of different incentives can cause a bias in behaviour because they are easier to understand. One company linked the complexity of the framework to the structure of our approach, arguing that the fact that we have measured and incentivised opex and capex separately "builds up a world between the two" and can limit flexibility.

Sustainable drainage – a case study

While the companies did not raise sustainable urban drainage as an issue during their meetings with us, some have reported that they think the existing regulatory framework incentivises capex rather than opex solutions in this area. We describe the interaction between sustainable drainage and a possible capex bias in more detail below.

Sewers are long-lived assets that require relatively little maintenance. But their capacity is finite. The effects of a changing climate and the use of impermeable materials around existing or new properties leads to more rainwater going into sewers. In future, the capacity of the existing sewers in England and Wales could be insufficient to withstand storms. They could be more likely to flood properties and to pollute the environment.

Conventionally, the companies' response has been to build bigger sewers. But this only tackles the symptoms and not the causes of flooding. Building bigger sewers to cope with higher flows is unlikely to be a sustainable solution. It would be very expensive and in extreme weather conditions, the sewers and downstream rivers could still be overwhelmed. Using sustainable drainage systems (SuDS) to manage demand for drainage is an alternative approach. This involves using more natural drainage processes, or encouraging more efficient use of drains and sewers.

These alternatives are likely to incur a greater proportion of operating costs compared with building bigger sewers. Often, SuDS are features that are above ground. Building them requires the companies to co-operate with other stakeholders, such as local authorities. At times, it may be more appropriate for a local authority to take ownership of any resulting

SuDS. In this case, it is conventional accounting practice to treat any financial contributions as operating costs as there is no resulting asset for the water company to treat as capital and pay off over the life of the asset.

When we consulted on SuDS, a number of companies considered that the existing regulatory framework incentivises capex rather than opex solutions. So, they thought that they have incentives to build sewers, rather than investigate alternative approaches.

There are also other reasons why the companies might prefer capital-intensive sewers to other approaches. For example, they consider that it may be more difficult to make progress while working in partnership with other organisations rather than delivering a solution in isolation.

Other drivers that could impact on the companies' decisions include the incentives on developers to install SuDS because of the automatic right to connect to the network. We will explore these issues in more detail as part of our sustainable drainage project.

2.1.2 Company culture – skill base and risk aversion

11. The companies raised risk and uncertainty in expenditure forecasts as potentially having a significant influence on bias. Several said that opex is seen as "more risky". There appear to be a number of reasons for this, including:

- the different regulatory approaches to opex and capex that affect the flexibility at a company level to deal with risk;
- a difference in the certainty of delivery between the two expenditure types;
- the certainty of cost forecasts; and
- the ability to control assets.

12. The companies also suggested that issues beyond the control of our regulatory framework are likely to be significant in any capex bias. Others suggested that an internal bias towards engineering solutions is more likely to cause capex bias in business planning and delivery. And they raised the separation of opex and capex in company structures and decision-making as an issue.

Water resources management and water trading – a case study

In their discussions with us, several companies provided examples involving water trading and bulk supplies. A number of them also raised bulk supplies as an issue in the context of 'Valuing water – how upstream markets could deliver for consumers and the environment', which we published in July 2010, and Defra's project on barriers to interconnections, which it published in September 2010.

The companies commented that if they built their own water source, then it would be added to their RCV and they would earn a return on it. But if they took a bulk supply, it would count

against them in our assessment of their opex. They said that this acted as a disincentive towards taking bulk supplies from neighbouring companies.

In their water resource management plans, the companies propose solutions to meet a certain level of demand during certain conditions. They assume a specific level of risk as part of this planning. Many companies argued that there was little incentive for them to take a bulk supply rather than build a reservoir.

Two companies in particular also made a link with risk. They said that it this was a greater concern for them than the capex/opex trade-off. From our discussions with them, it is clear that many companies perceive that owning and controlling an asset provides them with more certainty over their water supplies during times of scarcity.

Another company considered that there is a bias in the way its own employees think – they tend to consider capex solutions first. It thought that risky options are eliminated early in the process, leading to risk-averse solutions that are typically capex. One company linked this to the balance between penalties and incentives. In this example, there are penalties associated with maintaining security of supply.

The companies have differing views of all these issues. But it shows how the reality and perception of our regulatory framework, its interaction with other frameworks, and company culture combine to have an effect on capex bias.

2.1.3 Implications of ownership and financing structure

13. We have already highlighted the view that the ability of the companies to earn a return on capex and not on opex can influence their decisions. Linked to this, they also raised concerns about the implications of ownership and financing structures.

14. The RCV represents the capital value of each company for regulatory purposes. It provides a degree of commitment to remunerate investors for delivering substantial investment programmes for long-life assets. In 'Financeability and financing the asset base – a discussion paper', which we published in March 2011, we explained that the RCV has become the key measure against which investors assess the enterprise value of each company, and against which the markets measure leverage. It has become enshrined in bond covenants and the markets use it as a way of measuring a company's indebtedness. Although RCV growth must be financed, some companies and investors tend to focus on it as an indicator of company growth, and this may be a driver of capex bias.

15. One company said that our incentive mechanisms have little influence on investors because they do not have a significant financial impact. They may not distinguish adequately between good and poor performing companies. This has been echoed in some of our discussions with financial stakeholders.

16. Two companies mentioned the link between the level of gearing and risk aversion. It has been suggested that companies with covenanted structures could be risk averse compared with those with traditional financial structures. If we consider this argument alongside some companies' view that capex is somehow less risky, then the financing structure could be an influence on capex bias. One company put forward an alternative view that these corporate structures benefit from increased involvement at Board level by investors. It suggested that this could lead to greater challenge to a company's business plans.

2.2 Links with other water and sewerage sector regulators

17. As well as our regulatory framework, the aims and objectives of other regulators – such as the Environment Agency and the Drinking Water Inspectorate (DWI) – influence the choices the companies make. How our frameworks interact could create a bias in company decision-making.

18. In our discussions with the companies, we asked for examples of where the regulatory framework had caused them to favour capex solutions over opex solutions that might have been more efficient in delivering outcomes for customers and society. Some examples relate to matters within the Environment Agency's area of responsibility and – overall – the examples suggest that capex bias may not be an issue that affects all areas of expenditure. The companies considered that it could become more of an issue when meeting future sustainability challenges, such as carbon reduction and catchment management.

19. This reluctance to use opex solutions to deliver environmental and water quality outcomes appears to stem from a perception that they entail greater uncertainty of delivery, and a fear of failure and the likelihood of enforcement action. At our future price limits workshop in February 2011, many companies cited the risk of enforcement action from the Environment Agency and the DWI together with the uncertainty associated with some opex approaches as reasons why they did not implement certain solutions.

20. Some environmental stakeholders also suggested that the companies appear to be reluctant to implement opex solutions. The Environment Agency has indicated strong support for schemes that we would expect the companies to account for as opex rather than capex. This includes catchment management and water efficiency (or demand management) schemes. The DWI has also supported opex solutions to address the problems caused by lead pipes as part of a wider strategic approach. We are working with the Environment

Agency and the DWI to understand better their approaches to capex and opex solutions, in particular in the context of our desire to move to a more outcome-focused approach.

2.3 Other regulated sectors

21. Capex bias has been long recognised as a potential drawback to regulation. In its 2002 'Pipes and Wires' report the NAO recognised this issue and identified the risk of weaker incentives to achieve efficiencies in capex than in opex and attributed this to a combination of the:

- risk of reductions in the quality of network performance;
- difficulty of identifying external benchmarks for reductions in capital costs; and
- incentives to incur capex to increase the allowed revenue in the subsequent control period.

22. The NAO stated that the presence of these incentives can cause the companies to substitute capex solutions for opex ones, leading to an inappropriate mix that is not in the public interest.

23. Moving beyond this, we have considered the experience in other sectors and some of the steps that other economic regulators have taken to address relative incentives for opex and capex. For example, both Ofgem and Ofcom have attempted to equalise the incentives that price-controlled companies face.

24. Ofgem has done this by setting the electricity distribution companies' allowed revenues to enable them to recover a fixed proportion of opex and capex, regardless of what their actual expenditure profile is. And although Ofcom faced a slightly different challenge relating to incentivising the installation of Ethernet technology, it committed itself to the principle of technological neutrality. So, in two of BT's business areas it set a fixed efficiency factor for opex (and nothing similar for capex), and removed the base year associated capex costs.

25. In the aviation sector, one of the CAA's goals in involving airlines in a formal constructive engagement process was to have them challenge BAA's capital expenditure projections. The Competition Commission has recognised that one of the reasons for adopting this approach was to reduce the distortions to investment. But unlike many end-customers of monopoly businesses, airlines are aggressive, well-informed and motivated retailers, and more able and

willing to challenge BAA's investment programmes, despite the inevitable information asymmetry between themselves and the regulated company.

26. Capex bias appears to be less of an issue in the postal and rail sectors. For example, in the postal sector Postcomm decided to expense all capex and reimburse all costs. This had the effect of removing any differential treatment. But we note that this was only possible because of low levels of capital expenditure and the absence of a capital structure involving large levels of debt financing.

27. In the rail sector, a significant proportion of capex is treated and remunerated like opex. Network Rail is a company limited by guarantee. It has no equity investors and is dependent on public subsidy. It does not face the same incentives to maximise shareholder returns, as do most of the companies in the water and sewerage sectors.

28. In October 2010, the UK Government published its national infrastructure plan, which Infrastructure UK (IUK) will lead on delivering. The plan recognised the importance of investment in water and sewerage. It also discussed how investment could be directed to the key infrastructure sectors. While the plan covers all infrastructure sectors we recognise that this work may influence how we approach future price limits – and capex bias in particular.

2.4 Drivers of capex bias

29. Taking into account what the companies have told us and our own views, we set out below a list of potential drivers of capex bias.

Potential capex bias driver	Explanation
Return on capex	The companies have suggested this is one of the key drivers of capex bias. They consider that it is the result of us allowing a rate of return on capital expenditure that is remunerated in the RCV while opex is recovered from customers in the year in which it is incurred and earns no such return. When we have set price limits in the past, we have allowed the same cost of capital for all similar companies using a notional capital structure for the industry. But in some cases, the regulator may – when assessing its duties in the short and long run – 'aim up' on the cost of capital to secure that efficient companies can finance their

	functions. This has the effect of transferring part of the risk of revenue allowances being too low from company to customers in order to reduce the longer-term risk to customers[1]. For example, at the 2009 price review (PR09) we acknowledged the risk to customers of making too low a cost of capital assumption in the context of the market conditions at that time. But if the allowed rate of return is greater than a company's actual cost of capital, the company will be able to outperform the allowed rate of return. The extent to which a company can secure finance at a rate below the allowed cost of capital, may create an incentive for companies to bid up enhancement spend in their business plans and deliver capex rather than opex solutions where they may expect that expenditure to be remunerated in the RCV in future.
Financing and ownership	As discussed in section 2.1.3, companies and investors may focus on RCV growth as a metric that symbolises company growth. While RCV growth must be financed, the extent to which a company and its investors may focus on this metric could influence a preference for capex. Also, there may be links between the financing structure and risk aversion that could drive a bias.
Strength of financial incentives	If the companies out- or underperforms the assumptions we make about capex and opex when we set price limits, they receive some financial benefit (or penalty). The relative strength of these benefits and penalties can cause bias depending on how the companies react. For example, some companies have told us that the incentives to reduce opex because of the relative operating efficiency assessment are stronger than capital incentives like the capital expenditure incentive scheme (CIS). In some cases, this is perceived to limit opex, which introduces a bias. This suggests that the costs (rewards) to the company of overspending (outperforming) are perceived to be higher for opex than for capex. A further consideration is that any outperformance in enhancement capex can slow the growth of the RCV. This may also link to perceived levels of risk around maintaining service in future.
Strength of reputational incentives	Another possibility is that the reputational incentive that publishing the companies' relative opex efficiency creates[2] is stronger than the financial incentives.

[1] Europe Economics discussed the pros and cons of 'aiming up' in 'Future price limits – risk and incentives: options appraisal'. It discussed this as a regulatory tool to aim up the cost of capital or assumptions around other cost allowances in a price determination.

Information asymmetry	Information asymmetry exists because regulated companies have better information about their businesses than the regulator. This means that companies have the ability to include in their business plans additional unnecessary capex or 'gold plate' their assets, which the regulator might not challenge. The existence of a return on capex (and not on opex) could provide an incentive for them to do this. We introduced the CIS at PR09 to mitigate this effect.
Timings and approach of cost assessment	The approaches that we have taken to cost assessment use outturn expenditure as a starting point for assessing both future opex and capex. We use a top-down approach to assess opex and a bottom-up approach combined with a scope challenge for capex. Our approach to opex implies that past decisions are subject to future challenge as our approach to cost assessment challenges the total opex. Whereas, once capex is included in the RCV, the RCV tool provides a degree of commitment to remunerate investors for delivery of these long-life assets.
Timings of cost recovery	Capex is recovered over a longer time period than opex (that is consistent with the useful economic life of the asset). This minimises the short-term impact on bills (although the longer-term impact may be the same for the same amount of operating expenditure). Also, the mechanisms to allow for benefit or risk sharing are different for opex and capex. This links to the strength of financial incentives for different types of expenditure.
The regulatory treatment of capex and opex	The different approaches that we use to assess capex and opex at each price review could influence a company's preference for capex. Some companies have linked this point to their ability to manage risks that result in a potential overspend. They say that that the approach to capex is more flexible than the approach to opex (particularly as a result of CIS).
Company management structures	Many companies separate capital investment and operating decisions within their management structures. Where this is the case, how company processes join up the two forms of expenditure could introduce bias. We understand these management structures to be common across the water and sewerage sectors.

[2] In information notice 10/01 (IN 10/01) – 'Regulatory compliance – introducing a risk-based approach', we stated that we were no longer going to publish annual relative efficiency results.

Company culture and skill set	The companies have suggested that favouring capex solutions can relate to engineering preferences. They think that the experience and background of their employees could influence the solutions that they develop and the decisions they take. Employee performance measures and incentives will also have an impact.
Risk of failure and penalty strength	The presence of minimum standards and penalties could drive risk-averse behaviour. It could also influence the companies' approaches to risk management and limit the incentives for outperformance as a result. We set some of these standards; the Environment Agency and the DWI set others.
Control of assets	The companies have told us that they perceive the direct control of assets will increase their ability to service their assets and this creates a preference for capex. Although we have separated this point as a driver, it is clear that it is linked to the risk of failure and the company approach to risk management. We discuss this issue in more detail in section 3.2.
Wider requirements and incentives	Other requirements and incentives that we set (such as the service incentive mechanism), or that are set by others (such as the Environment Agency, DWI and Revenue and Customs) have the potential to alter companies' preferences.

2.5 Forms of company behaviour – manifestations of bias

30. Having considered the drivers that could create a capex bias on the part of the companies, we now explore whether there is evidence that a bias actually exists. We recognise that there are two distinct potential manifestations of capex bias:

- the actual choice of solution; and
- the way any given solution is accounted for.

31. We can understand the companies' behaviour if we distinguish between these.

2.5.1 Bias in choice of solution

32. We define bias in the choice of solution as a company choosing a solution or strategy to resolve an issue when a better one for customers and wider society exists. A bias in the choice of solution can occur every time a company chooses to spend money. Whether bias is present in these decisions is dependent on several factors, including:

- differing incentive strength of opex and capex (the regulatory framework has a powerful influence on this);
- the process and procedures within the company to generate solutions;
- the companies' understanding and approach to risk management and decision making at all levels within the organisation;
- the approach that the company uses to make decisions; and
- if a company focuses on the short or longer term.

33. During price reviews, our challenges to the scope of the companies' capex programmes has limited their ability to choose sub-optimal solutions that favour capex rather than opex.

2.5.2 Bias in capitalisation policy

34. We define this as a company choosing an optimal solution, but where the costs are categorised differently. The way that costs are accounted for is a key component of regulatory reporting. This is because the companies are required to classify expenditure to comply with regulatory accounting guidelines. Changing the classification of costs should not cause any operational problems.

35. But a bias in capitalisation policy would indicate that the companies have more to gain by classifying a solution as capex rather than opex by increasing the return they receive from customers through their regulated revenue. An example of this form of bias could involve classifying opex as maintenance or enhancement expenditure.

36. A company's ability to do this (and hence to increase its revenue) is limited in two ways.

- It has to comply with regulatory accounting guidelines.
- As part of our regulatory challenge, for the purposes of price setting we reserve the right to reallocate expenditure that has been misallocated because of capitalisation policies.

2.5.3 Observable indicators of capex bias

37. We have looked for observable indicators of bias in order to understand whether and to what extent it exists. We identified the following four possible indicators.

- Changes in opex and capex over time (with an increasing trend toward capex) might suggest a bias.
- The relative levels of outperformance will indicate where companies have incentives to outperform or not. Relatively high levels of outperformance

will indicate that there are problems with scoping, the incentives are stronger or the opportunities for technological change are stronger.
- Evidence that the companies are developing low levels of potential opex-based solutions for consideration when assessing the optimal solution.
- If an opex-based solution is the best one for customers, evidence of a reluctance to carry out that solution.
- The level of transfers we are required to make between expenditure categories at price reviews or during the price control period, with more frequent and higher values indicating a greater problem.

38. The problem with these indicators is the lack of an alternative world we know to be bias-free, against which we can compare the status quo.

39. So, when considering changes in opex and capex over time, we have examined the ratios of opex to capex and rates of change. If there is no capex bias, we would expect to see stable ratios, assuming there were no other factors to influence expenditure. But when we examined trends and causes, it became apparent that it was not possible for us to draw any conclusions because too many effects could not be controlled. This includes:

- controlling for the impacts of quality investment;
- changes to risk management; and
- identifying the rate of capitalisation in the absence of any bias.

40. As for the second indicator, historically we have observed high outperformance for capital enhancement projects. This effect was perceived to be an issue relating to scoping and information asymmetry. Our response to this was to introduce the CIS at PR09. We are yet to see the impact from this mechanism. For opex, the observed levels of outperformance are significantly different across the companies. Although it is difficult to conclude anything from the data, this observation may be an indicator of wider influences on bias, including company culture.

41. For the third indicator, if there were a bias, we would expect to see companies discussing the process of generating opex-based solutions in their business plans and press notices. It is clear that the companies are considering a range of solutions, including opex-based ones, in areas such as water resources management. But it is clear from their business plans and our discussions with them that this is being pursued to differing degrees.

42. Some companies have told us anecdotally that there is a reluctance to carry out optimal solutions because of concerns relating to the perception of risk and asset ownership. In some cases, this has involved companies leaving

opex-based schemes out of their business plans, regardless of whether they are known to be the optimal solution. It is also evident from the companies' business plans that relatively few operational solutions are included compared with capital solutions.

43. Similarly, if there were a capex bias manifesting itself in the companies' choice of capitalisation policy, we would expect to see significant transfers from capex expenditure categories into opex expenditure categories during price reviews (assuming that we had challenged such behaviour). At PR09, we observed that these transfers amounted to about £145 million of opex from capex. We also observed a further transfer of £1 billion of capital maintenance expenditure from enhancement expenditure. This suggests that there could be a capex bias manifesting itself in the companies' capitalisation policies. Some companies have confirmed this anecdotally.

44. So, while we have observed that some factors suggest that there is a capex bias, a combination of other factors means that it is difficult to reach a clear conclusion on what is driving this.

2.6 Are financial incentives a driver of capex bias in our regulatory framework?

45. In section 2.4, we set out the relative strength of the financial incentives as a potential driver of a capex bias. In appendix 2, we test whether our current approach to regulation through the price setting process could introduce capex bias. Specifically, we are testing whether greater returns arise because of the regulatory treatment of capex compared with opex.

46. This analysis only covers the financial incentives that affect the companies' decisions during a control period or delivery phase after we have determined price limits. We have based the incentives on those applied at PR09. While planning, reputational and procedural incentives will also influence these decisions, we have not taken them into account in our analysis.

47. The modelling in appendix 2 shows that different degrees of bias exist depending on the circumstances. This can include if a company is out- or underperforming, or if certain incentives (such as the opex rolling mechanism or CIS) apply. But the analysis we present is theoretical and the scenarios are stylised. We acknowledge that the real-world situations in which the companies find themselves will differ from those in our analysis. But it does provide a useful insight.

48. Our analysis suggests that decisions relating to a choice between underperformance in either capex or opex result in a capex bias. But decisions relating to outperformance are mixed. The effect of expenditure (or a saving) in one-off opex has a significant influence on the results.

49. For example, in the case of outperformance a company would choose to outperform in one-off opex over capex, although it would choose to underperform in capex over one-off opex. Both scenarios represent a capex bias. But as most of a company's opex is ongoing, this is not always an available option. When this is the case, the type and degree of bias observed are dependent on a variety of other incentives and assumptions.

50. We show the effects of these incentives and assumptions in the table below. Although we observe a capex bias for underperformance, the table shows how the individual incentives strengthen or weaken the results.

Table 1 Effect of incentive or assumption on the increased likelihood of a capex or opex bias

Incentive or assumption	Underperformance[3]	Outperformance
High-level CIS baseline ratio	Opex	Capex
Low-level CIS baseline ratio	Capex	Opex
Apply opex rolling multiplier	n/a	Capex
Inefficient company	Indifferent	Capex
Increase the length of analysis	Opex	Opex
Financing efficiencies	Capex	Opex

Note: We have isolated the effects in the table. In reality, the bias will depend on the combination of circumstances. Line one of the table, for example, sets out that a high-level CIS baseline ratio (opposed to a low ratio) increases the likelihood of an opex bias if underperforming – that is, a preference for spending opex rather than capex. The outperformance column shows that a high-level CIS baseline ratio increases the likelihood of a capex bias – that is a preference for saving opex rather than capex.

51. We recognise that our financial modelling is based on existing incentives, whereas much of the anecdotal evidence and observable indicators is based on incentives from the previous price control period. The key distinction between these periods is the implementation of the CIS and the impact this had on incentives. Previously, underperformance in capex was equivalent to one-off opex whereas capex outperformance – although not the same as the current incentives – was similar to the ongoing opex incentives.

[3] In the case of underperformance, the terms capex and opex indicate a strengthening or a weakening of the preference for capex.

52. Although our regulatory incentives may cause the companies to prefer opex or capex depending on their individual circumstances, our key learning points from this analysis are that:

- it is not clear that our regulatory incentives overall are systemically biased to capex because of the financial incentives alone;
- there is a difference between the symmetry of our incentives for outperformance and underperformance;
- we recognise that there is a need to review our approach to the appropriate level of recovery of unanticipated one-off opex;
- the level of the CIS baseline ratio outcomes could be influencing behaviour during the price control;
- the opex rolling incentive mechanism is increasing the likelihood of a capex bias;
- the incentives to achieve financing efficiencies and RCV growth are clearly having an important influence, increasing capex bias in both business planning and delivery underperformance. Although our modelling suggests that achieving financing efficiencies increases the likelihood of an opex bias for delivery outperformance, it is likely that the incentive to grow the RCV combined with the long run potential to achieve financing efficiencies is mitigating this; and
- the process of modelling has shown that the type and degree of bias differ in every scenario. This implies that when developing our approach to future price limits it will be difficult to equalise incentives under all circumstances.

53. The modelling has shown that our overall economic regulatory framework is complex. This is important as our discussions with companies indicate that their perception and behaviour is clearly linked to their reaction and understanding of our incentives, as well as the influences of many wider issues. The anecdotal evidence suggests that the companies are not always reacting to the incentives in the way we intended them to work and have modelled.

3. Tools to address capex bias

54. In this chapter, we outline the range of tools available to us and the companies to address capex bias. We consider each of these in turn and then examine briefly the influence they have over each of the drivers. We are using these tools as a means of developing the options to address capex bias that are available to us during price setting. We present these in chapter 4.

55. Regardless of whether all the areas outlined in chapter 2 are generating a bias, it is also apparent that some companies perceive that one exists, and that this can become self-fulfilling. This perception alone could provide a reason for considering change. It is clear that we should consider addressing cultural issues, as well the regulatory incentives. We will consider these issues in our overall approach to price limits and mitigating risk.

3.1 Tools available to the regulator to affect capex bias

Tools available to the regulator	Explanation
Cost assessment	As several companies noted, our approach to cost assessment differs for opex and capex. We are considering options around the methods of cost assessment, including: • whether we should treat opex and capex separately; • whether we should take a top-down or bottom-up approach; • the data we should consider; and • the timings of the assessment.
Financial incentives	At present, we use a range of financial incentives. Each one has the potential to introduce different degrees of bias. The financial incentives we can use could vary by their symmetry, relative strength and timings. We can also apply them up front or retrospectively.
Cost recovery	Our approach to cost recovery has significant potential to create or alter bias. A company wishing to grow its RCV will favour enhancement schemes. But this could cause capex bias.
Risk	The degree to which risk is shared between the companies and customers can be built into incentives, cost assessment and recovery. An example of this is how we design the mechanisms to recover expenditure that is not foreseen at the time of price reviews.

Inputs, outputs and outcomes	Our approach to measuring service levels and performance influences the companies' decisions. If we are too prescriptive, we could limit the companies' choices and their approach to risk management.
Other incentives	We can work with other regulators, such as the Environment Agency and the DWI, to understand how their incentives influence decision-making.

56. We recognise that the regulatory tools will influence company behaviour. We are considering all these areas as part of our future price limits project.

3.2 Tools available to the companies to affect capex bias

Tools available to the companies	Explanation
Risk management	The approach a company takes to risk management will influence bias. The sectors are moving towards a greater understanding of risk and – on the whole – the companies' used risk-based approaches when developing their business plans for PR09. But few companies took a risk-based approach when developing their base opex forecasts. The companies are responsible for balancing their plans and managing risk. This is different to minimising risk. Decision-making and understanding at all levels will influence whether a company adopts in its plan an appropriate balance between capex and opex. Effective risk management will also involve understanding risk and uncertainties associated with cost forecasts and including these in decision-making. This should include understanding the degree of protection provided by RPI inflation that is factored into price limits. We recognise that, because of their nature, many sustainable solutions can be uncertain in delivery. If this is the case, the companies that use cost-benefit analysis techniques are likely to be including this uncertainty in their decision-making. Opex-based solutions are usually found in emerging fields. Where this is the case, we would question how much of this uncertainty is the result of a lack of experience and comparators. This requires the companies to be willing to trial new ideas and, where appropriate, we need to be able to support this. One issue raised in association with the use of bulk supplies was the perception of increased risk. In a competitive environment, a company would mitigate this risk through an enforceable contractual obligation

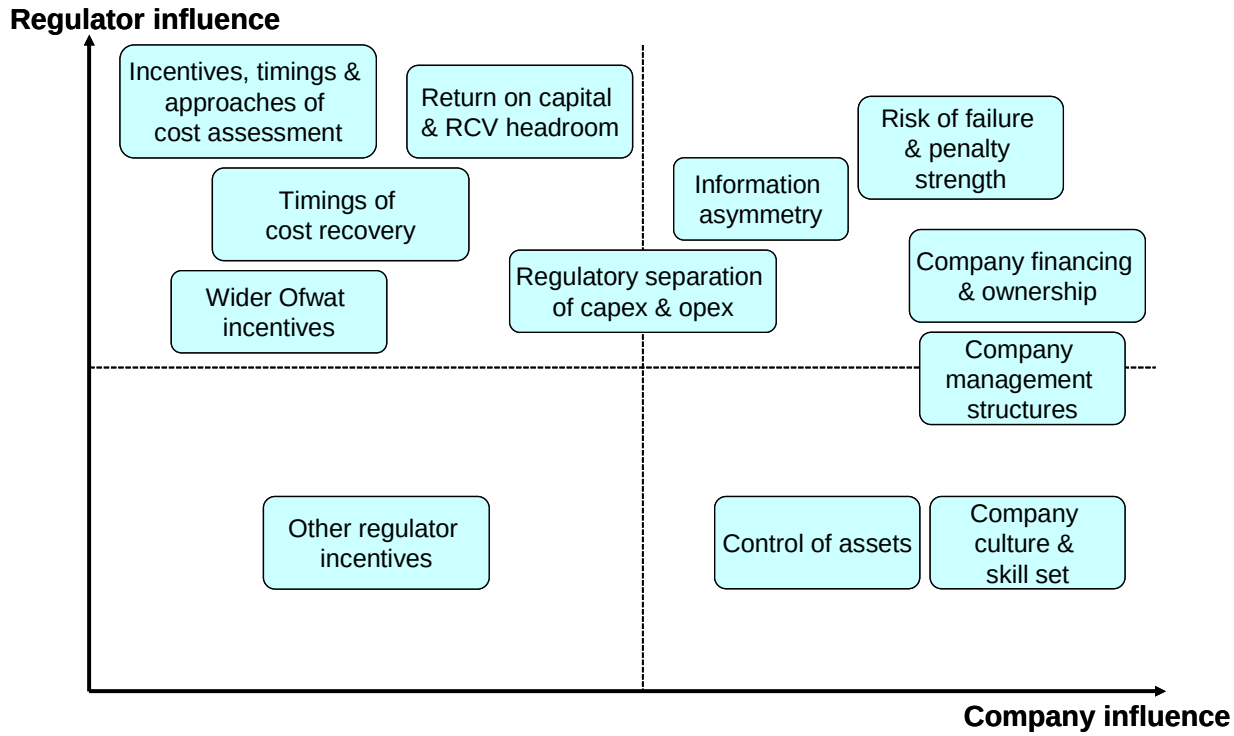
	that places a suitable value on this risk. This is a tool that the companies can use. We would expect to see wider application of commercial techniques and approaches to risk management that are similar to companies operating in a competitive environment.
Choice of management structure	The companies have direct control over the structures they choose to implement. It is the company's responsibility to understand the extent to which its chosen structure influences bias or hinders the generation of solutions and to mitigate this through processes and challenge.
Mix of skills	The skills and training within a company are key to effective risk management. Different skill sets and experience will lead to different approaches to generating solutions and strategies. The companies have a proven track record in engineering and in generating conventional, asset-based solutions. But in the future, they may need to complement their traditional core competencies with skills and experience that encourage more innovative approaches.
Metrics/objectives	The metrics and objectives that a company, its owners and its investors use will drive directly the behaviour and decision-making of its employees.
Accounting policy	The ways that accounting guidelines are interpreted can affect capex bias.

57. The companies will need to change their culture if they are to use these tools effectively. Their Boards will need to give them a clear steer to drive this cultural change.

3.3 Ability to influence the drivers

58. Having considered the tools available, we have summarised the ability for the regulator and the company to influence each of the drivers of bias. The diagram below illustrates this.

Figure 1 Ability to influence the drivers of capex bias



4. Ideas to address capex bias within future price limits

59. In chapter 2, we acknowledged that the perception of a capex bias suggests there may be a case for us to change the way in which we use our tools. In this chapter, we set out a number of possible courses of action that we could take to help address the perceived capex bias on the part of the companies.

60. We have developed these ideas through our work with stakeholders. We have also included ideas suggested at our future price limits workshop in February. The options we set out fall into three main categories, all of which can be assessed against the status quo. Appendix 3 contains more detail on each of the options outlined below.

61. The courses of action within the first group of options involve changes to the rate of return.

- **Option 1 – adjusting the rate of return** allowed on the companies' RCV ex-post so that it is equal to their actual cost of capital, to reflect the costs incurred.
- **Option 2 – allow a return on operating expenditure** and equalising it with a return on the RCV. If customers are not to face higher prices as a result of this option, then we would need to reduce the rate of return on the companies' RCVs to leave them in neutral present value terms.

62. The options within the second group involve increased scrutiny of the companies' expenditure programmes to identify the 'right' mix of solutions.

- **Option 3 – scrutinising incurred capital expenditure more intensively** ex-post at the next price review before allowing it into the RCV. This also means not allowing it if it cannot be justified.
- **Option 4 – a customer pre-approval mechanism,** that may be similar to the one that the Competition Commission considered during its 2008 review of Stansted Airport's price control or could be a variant. Essentially, we would only allow capital expenditure above a certain threshold into the RCV if customers agreed it, using some kind of approval mechanism.
- **Option 5 – a regulatory pre-approval mechanism,** in which the companies would submit investment plans to us before they carry out significant investment. We would only allow capital expenditure into the RCV once we had approved the investment plans.

63. In the third group, the options involve changing one or more aspects of our approach to price reviews. This would have the effect of altering the incentives for the companies.

- **Option 6 – a total expenditure or 'totex' cost recovery approach,** similar to the one that Ofgem has adopted with its pre-determined ratio for capital and operating expenditure entering the RCV for remuneration.
- **Option 7 – an enhanced menu regulation incentive,** so that the companies are indifferent between outperforming their capex and opex forecasts.
- **Option 8 – reforming our benchmarking and cost assessment for opex and/or capex** to make the approaches more consistent.
- **Option 9 – changing retention periods** for opex and capex outperformance.
- **Option 10 – a procedural incentive** that assesses each company's approach to joined-up thinking in developing capex and/or opex solutions.
- **Option 11 – an outcomes-based incentive** to encourage the companies to focus on the outcomes that benefit customers and the wider society by taking a balanced and mature approach to risk (by being less constrained in their approach to specific situations).

64. These three groups of options can be compared with the **option of the status quo,** retaining the existing mechanisms and incentives.

65. It is important to note that because a large number of influences can alter the companies' preferences, it is unlikely that one option on its own would be effective. It is also apparent that it is difficult to equalise incentives and that any approach chosen is unlikely to equalise incentives under all circumstances.

66. We will consider and develop these options further as part of our future price limits project. We will also consider other options that address specific areas where we have found evidence that problems exist. It is clear that not all of the options presented are feasible and that some suggested carry disadvantages that would outweigh any beneficial effects. Also, the impacts of some of the options are unclear at the moment. It is also clear that one option on its own is unlikely to be effective.

67. But, of the options outlined above, we think that some are less attractive than others to address capex bias. We discuss this in more detail in appendix 3. Although we consider that options 4 and 6-11 may be relatively more attractive, we are exploring those options as part of our work on future price limits.

68. Whichever option (or options) we include in our framework for the next price review, we will need to ensure that they:

- have a clear aim;
- are proportionate to that aim;
- are clear and transparent;
- minimise unintended consequences; and
- are robust to change and adaptable.

69. We discussed the characteristics of good incentives in more detail in 'The role and design of incentives for regulating monopoly water and sewerage services in England and Wales – a discussion paper', which we published in October 2010.

5. Next steps

70. We will continue to consider how we will set future price limits until early 2012. At that point, we will publish a framework document that sets out our aims for price limits in 2015-16 and beyond, and the tools and principles we propose to use in setting them.

71. We will consult on this framework document towards the end of 2011. Before then, we will publish a number of other documents to inform the debate about particular aspects of setting price limits. As we develop our thinking, we will consult our advisory panel and meet with key stakeholders. The issues regarding capex bias that we expect to consider are set out below.

1. Are you aware of any further evidence that we should consider in deciding whether or not the water and sewerage sectors suffer from capex bias? If so, what is the magnitude of that bias?
2. What do you consider to be the drivers of any capex bias? Are some of these drivers more important than others? To what extent is our regulatory framework a driver?
3. Are there any further options for addressing capex bias that we should consider?
4. How effective would each of the options be? On what would their effectiveness depend? Would some options be more effective in some circumstances?
5. How will each of the options work alongside the ideas discussed in our other discussion papers – in particular, those on risk and incentives?
6. What might the unintended consequences be for each option? How material would they be? If they are material, how could we mitigate them?
7. Do you agree with those options we have identified as more attractive should we decide to make changes to address any capex bias?

72. We would very much like to receive contributions on these and other issues. If you would like to contribute to the debate, please contact Gordon Frazer, Future Price Limits Project Manager (gordon.frazer@ofwat.gsi.gov.uk).

Appendix 1: What the companies have told us

As part of the work we have carried out in our future price limits project, we met with each of the companies. This was so that we could understand their views on the project, and on any particular issues. We also asked them to share with us any ideas they considered might be relevant to this project.

In each case, we asked the companies specifically for their views about possible capex bias. This appendix expands on the information we set out in chapter 2.

Overall, we received mixed messages from the companies. Some said that there is a bias (often for different reasons); others considered that it was only a perception they had.

About half of the companies stated clearly that they did not perceive there to be a bias towards capex within their decision-making. Usually, they based this on their view that they have developed their business plans using cost-benefit and whole-life cost techniques. One of these companies considered that a bias did exist immediately after privatisation, but that this effect had disappeared as the water and sewerage sectors matured.

A couple of the companies suggested that the perception that a bias exists is becoming 'self-fulfilling' in the sectors. Indeed, one company said that, "to an extent, it doesn't matter how **theoretically** balanced the regime is, it matters how companies **perceive** it to be."

In our meetings, we encouraged the companies to use examples to highlight issues. We have categorised these in more detail below.

A1.1 Regulatory framework

Eight companies said that our regulatory framework influenced their preference for capex or reducing opex, particularly:

- that capex earns a return but opex does not; and
- the use of an ex-post relative efficiency assessment for opex.

When we discussed relative efficiency or opex projections, the companies considered that the affordability constraints they experienced during business planning led to a degree of self-censoring. The result of this was a stronger scrutiny of opex to avoid overspends.

For some companies, this implies that they consider the regulatory framework to be biased in favour of solutions that have a predominant capex component. In particular, one company said that the problem at business planning is that it does not know how its choices will affect their future relative efficiency target. We note that we have stopped publishing the companies' relative efficiency and have not decided how to approach cost assessment in the future. We also note that four of these companies also said that they use cost-benefit and whole-life cost techniques to make decisions.

Another company linked the pressure on opex to the reputational element of relative efficiency, mentioning that environmental groups also think the same. Several other companies also held this view, and at our future price limits workshop in February suggested that the reputational effects of these incentives may outweigh the financial effects. But, in a face-to-face meeting, one company mentioned that it perceived the reputational impact of overspend to be equally strong on both sides.

A few companies raised the classification of costs as an issue. One said that there is an incentive to misclassify expenditure, while another said that it would classify costs as capital expenditure by default if there was an element of uncertainty.

The companies raised the issue of the timing of regulatory incentives several times. One said that there are "sharper (short-term) incentives to cut opex than capex in terms of returns, and to maintain them at these lower levels". This company questioned whether the regulatory framework strikes the appropriate balance between incentives on costs and incentives to produce a 'good' level of service.

One company stated that – in theory – there is no bias, but in practice, reporting of opex is much more immediate, annual and visible and, as a result, it could be argued there is a bias in reporting, because of the immediacy of the impact in the profit and loss accounts.

The companies made the following specific comments on incentives.

- A couple of companies mentioned that the incentive benefits for the service incentive mechanism (SIM) affects their investment decisions between opex and capex to improve performance. This relates to the decisions that have different effects on the speed of reaction that suggests a propensity for opex and how up-front investment could avoid issues through risk minimisation.

- One company mentioned that it considered the CIS to be a barrier to outperforming capex. In contrast, another stated that the CIS did not cause bias, but allowed it to think differently about 'spend to save' schemes.

- One company raised as an issue the different materiality thresholds for the potential recovery of expenditure between opex and capex. We understand this to mean that we have committed to allowing all capital expenditure to be added to the RCV and the CIS mechanism allows partial recovery of this additional expenditure. Although the relative efficiency assessment allows the partial recovery of reoccurring opex in a similar way, there is no mechanism for one-off opex unless it is part of an IDoK or change protocol.

The companies also raised the complexity of the regulatory framework as an issue. Several commented that they did not understand certain areas, or that they struggled to explain some incentives to their Board (these comments focused mainly on the introduction of the CIS). This could influence a bias as the companies may be reacting to areas they understand or can communicate. This suggests that areas that are less well understood are less effective.

One company linked the complexity and understanding introducing a capex bias to the:

- structure of our approach; and
- historic fact that we measure and incentivise opex and capex separately, which "builds up a world between the two".

A1.2 Risk, uncertainty and control

The companies raised risk and uncertainty as a key issue in potentially influencing capex bias. Several mentioned that they see opex as being "more risky". Three different reasons appear to lie behind this statement.

- The first links to the regulatory framework and the difference between the treatment of opex and capex in existing price controls. The specific concern is that we assess opex using a top-down approach that rolls forward a base year and combines this with an ex-post relative efficiency assessment. On the other hand, we assess capex using an ex-ante bottom-up approach based on unit costs.

  Our discussions with the companies suggest that they perceive each of these approaches has different implication on the ability to manage risk, with risk management and mitigation being easier for capex. This appears to relate to the influence of the relative efficiency assessment for opex and the perception of affordability constraints mentioned above.

- The second reason centres on the certainty of cost. A couple of the companies have quoted the uncertainty associated with forecasting opex in the long run and the corresponding certainty of capex as a potential reason for bias. To the extent that capex involved contracting out, the companies may also be able to transfer cost risk up the supply chain to a greater extent than they can with opex. They have also mentioned lack of clarity and certainty on payback for opex solutions, which can lead to ideas not being generated internally, to avoid them being rejected.

- This reason also appears to link to the certainty of delivery. Many companies have said that capex solutions provide greater certainty of delivery. An example that some have cited relates to the quality of the water environment. Building additional treatment capacity that the company would own and control is seen as providing greater certainty to meeting drinking water quality requirements than would, say, contracting with farmers to limit their fertiliser use or changing their land management methods.

  The companies have argued that if they were to be subject to onerous enforcement action for compliance failure, they would mitigate this risk by choosing the capex solution. But other companies argued that this risk could be mitigated, for example through contracts with the farming community.

A1.3 Culture and skill base

Several companies have noted that ideas and solutions are usually generated by people who are not close to our regulatory framework. So, they are unlikely to be influenced by any bias associated with economic regulatory mechanisms. The companies have suggested that issues beyond our framework are likely to be significant in any capex bias.

The predisposition of problem solvers and decision-makers within the companies was cited several times. They suggested that an internal bias towards engineered solutions was more likely to cause capex bias than our regulatory framework. One company said that its Board was more likely to lean towards projects with a large engineering component as its directors were more likely to focus their challenges on issues such as risk that were likely to take the Executive towards ‘build’ solutions.

Further to this, a couple of companies raised the separation of operations and capital maintenance within their structure as a potential barrier to joined-up and optimal decision-making. We note that in some cases accountability is only joined-up at Board level. One company in this situation said that it had recognised this issue. It now gets real challenge from its Board when engineered solutions are discussed.

A1.4 Ownership and financial structure

A number of companies raised the implications of ownership and financing structures as an issue. This is linked to the suggestion that the return on capital expenditure can influence a company's decisions.

The RCV represents the capital value of each company for regulatory purposes. It provides a degree of commitment to remunerate investors for delivering substantial investment programmes for long-life assets. In 'Financeability and financing the asset base – a discussion paper', which we published in March 2011, we explained that the RCV has become the key measure against which investors assess the enterprise value of each company, and against which the markets measure leverage. It has become enshrined in bond covenants and the markets use it as a way of measuring a company's indebtedness. Although RCV growth must be financed, some companies and investors tend to focus on it as an indicator of company growth, and this may be a driver of capex bias.

One company said that our incentive mechanisms have little influence on investors because they do not have a significant financial impact. They may not distinguish adequately between good and poor performing companies. This has been echoed in some of our discussions with financial stakeholders.

Two companies mentioned the link between the level of gearing and risk aversion. It has been suggested that companies with covenanted structures could be risk averse compared with those with traditional financial structures. If we consider this argument alongside some companies' view that capex is somehow less risky, then the financing structure could be an influence on capex bias. One company put forward an alternative view that these corporate structures benefit from increased involvement at Board level by investors. It suggested that this could lead to greater challenge to a company's business plans.

Another highly geared company highlighted how important it considers the RCV to be. It acknowledged that inflated acquisition values could encourage a bias towards capex to recoup the value of the organisation. Another company that also raised this issue noted that its investors do not see increasing the value of the RCV as a priority.

A1.5 Examples of capex bias

When we met with the companies, we asked for examples of where they considered there to have been a capex bias in decision-making. We hoped that examples would help illustrate the phenomenon, or lead to an understanding of the root causes.

Some companies were clear that – in their view – they had never made a decision that favoured a capex solution that would have produced a better outcome for their customers. Others did provide some examples, which we have set out below (starting with the most commonly cited ones).

- Water trading and choosing between a bulk supply and a capex solution, commonly a reservoir.
- Wider water resources issues – such as choosing between a reservoir, leakage and/or water efficiency.
- Catchment management solutions.
- Innovation and R&D schemes.
- Air scouring of mains.
- Compliance at sewage treatment works by bringing in liquid oxygen or building another stream of activated sludge.

Two companies mentioned that capex solutions were the only viable option for most maintenance or enhancement schemes. One company stated that pure opex solutions were not very common. Another said that opex only defers capex, which raises the issue of a bias in timing. The company gave the example of discoloured water as a result of iron water mains. It said that an opex solution could remove the discolouration, but it would not stop the gradual degradation of the pipes. So, it would take a capex solution to replace them.

This raises the question of whether, if a bias exists, it covers all areas of expenditure. Based on our discussions with the companies and the examples quoted, it would suggest that a bias is more of an issue for areas where the companies are looking to do things differently. We note that this relationship could also relate to issues on risk.

One company echoed this and said that a bias will be more of an issue in the future when choices between opex and capex schemes could become more important in the context of sustainability.

Appendix 2: Modelling the regulatory incentives

This appendix explains the background and assumption to the results presented in section 2.7. We aim to test whether our current approach to regulation through the price setting process could introduce capex bias. Specifically, we are testing whether greater returns arise because of the regulatory treatment of capex compared with opex.

This analysis covers only the financial incentives, which contribute to the capex bias drivers that effect the companies' decisions during a control period. Planning, reputational and procedural incentives will also influence this analysis. While we have not included the impact of these in our modelling, we discuss them alongside other impacts at the end of this appendix.

We assume that a hypothetical water company has a choice between different ways of producing an output. It can do this by incurring capex, one-off opex or re-occurring opex. We consider both under- and outperformance. If we see our financial incentives resulting in a company receiving greater profit from investing in capex, we would consider that to be a driver of capex bias.

A2.1 Underperformance

The first basic scenario assumes there are three ways of producing a given outcome.

- **Option 1 –** investing in additional water treatment processes, incurring £100,000 of capex in the first year of a five-year control period.
- **Option 2 –** engaging with landowners to develop a catchment management solution, incurring £100,000 of opex in the first year of a five-year control period.
- **Option 3 –** changing the chemical dosing of the water, incurring £6,600 opex in the second year and each year after that, for a period of 30 years[4].

[4] We note that this number will change depending on the length of time considered. We have chosen 30 years based on the average life of above-ground assets. In many cases, asset lives are much longer. So, where the results are sensitive we also test the impact using an 80-year scenario. This is important because the analysis assumes that the outcome to customers is the same under all options and that the present value of the investment, prior to the application of the incentives, is the same across all options. This is based on an assumed discount rate.

We assume a company could choose to implement any of these three options[5], although there are a number of other ways in which it could face a similar choice.

If we assume that the company has a cost of capital of 5%, all things being equal, it should be indifferent to the choice between the three options, since the present value cost of option 3 will be the same as of options 1 and 2. This means that a company should be able to make the same profit from each option. But a profit-maximising monopoly water company regulated by RPI-X price controls will make its decision based on how it impacts on its actual costs in relation to the funding it receives through regulated revenues.

Below, we set out the basic assumptions of the model that are common to all scenarios unless explicitly stated.

Assumptions

- The company has a pre-tax cost of capital of 5%.
- Where differences in capex occurs, it is assumed that the regulator will adjust the RCV at the next price review to reflect the investment the company has undertaken.
- We also assume the CIS introduced at PR09 applies, and any penalty or reward applies at the beginning of the second control period.
- The CIS baseline is 100.
- When the CIS penalty/reward is applied, the company receives an adjustment (known as a 'true-up') to ensure it only receives the penalty/reward prescribed by the CIS matrix.
- The expenditure is above-ground enhancement investment, has an illustrative asset life of 30 years, with straight line depreciation. This is to reflect the typical asset life of above-ground expenditure.
- For simplicity, we have assumed that any additional expenditure represents inefficiency relative to the company's peers and this expenditure is subject to a relative efficiency assessment for the second and future price control periods.
- The relative efficiency assessment is based on the fourth year of the price control. This is the same year's expenditure used to assess opex in the subsequent control period.
- The company will not earn a return on any one-off opex incurred either during the price control period or at subsequent reviews.
- The operating expenditure rolling incentive applies. This means that the company retains

[5] These options are for illustrative purposes only. We recognise that they are absolute, and that most decisions will involve a choice between a combination of capex, re-occurring opex and capex with varying degrees of opex. We also recognise that the values involved do not necessarily reflect the example but we have chosen to do this for simplicity and to illustrate the effects.

operating outperformance for six years.

In each of the scenarios we have presented, the modelling assumes the company deviates from its regulatory determination, but in subsequent price controls the choices are reflected though the appropriate mechanism. So ongoing opex choices are reflected in the assessment of future opex allowances, while capital decisions are reflected in the RCV and the CIS penalty or reward applies.

In this first scenario, we assume that neither the company nor the regulator anticipated the expenditure at the time at which price limits were set. In a scenario of underperformance, a company would choose to underperform in capex compared with opex if a capex bias is present. We set out the results for the company in the table below.

Table 2 Change in net present value (NPV) of a regulated company given three expenditure options

	Benefit to company, shown as NPV[6]
Option 1 – capex	-£30,000
Option 2 – one-off opex	-£100,000
Option 3 – ongoing opex	-£53,500

The table illustrates that if a company were to choose a solution, it would choose option 1. But if this were not possible, then it would choose option 3 over option 2 as the expenditure is ongoing opex, rather than opex entirely incurred in the control period. These results suggest that our financial incentives may create a reason for companies to prefer capex.

But if we assume that all the companies increased their re-occurring opex, then the additional expenditure would not cause any impact on relative efficiency. If this is the case, then the company would choose option 3 (the re-occurring opex scheme).

This basic scenario assumes that investment is not funded during the first price control. We have also modelled investment that is funded where there is a defined percentage of underperformance. This is more realistic. The analysis shows similar results, but implies that the strength of the disparity in regulatory incentives changes depending on the degree of underperformance. This is linked to the application of the relative efficiency targets.

[6] Based on a 25-year analysis.

This modelling is illustrative. In reality, the following effects are likely when considering this scenario.

A2.1.1 Use of efficiency bands

Our modelling assumes a continuous impact on relative efficiency. But at PR09, we banded the companies. The likelihood of companies moving a band will be linked to their position in the band and the scale of the investment decisions. It will also be offset partially by our precautionary approach to placing the companies in bands. We note that the examples the companies raised (and included in appendix 1) where capex bias is an issue only relate to certain expenditure and this is often at the margins. But we have observed that the companies think that any change in expenditure will affect their efficiency.

A key point related to this is that if the change affects all the companies then there will be no impact on the relative efficiency and no loss in future control periods.

A2.1.2 Form of model

Additional expenditure can also affect the modelling. This is because expenditure could change the future value of the explanatory factors in the modelling. This will reduce the losses shown in table 2 – mitigating the capex bias and potentially creating an opex bias.

A2.1.3 Including expenditure in our efficiency assessment

We may not include all additional expenditure in our relative efficiency assessment. This is could be because the expenditure is atypical (such as expenditure in a drought) or the expenditure is outside of the company's control and where we can not account for it in our efficiency modelling.

A2.1.4 Company reactions

Although this example is illustrative, if the impacts outlined above do not apply then in reality, the companies would react to avoid incurring the losses above by making efficiencies in other areas.

A2.2 Outperformance

Our second scenario assumes that each of the options is funded in the first price control period. This is significant as the predicted costs are already included in the regulatory revenue and a profit-maximising company would be looking to make efficiencies and outperform its final determination. For illustrative purposes, we assume that the company is able to outperform the expenditure by 20%. We have set out the results below.

Table 3 Change in NPV of a regulated company given three expenditure options

	Benefit to company, shown as NPV
Option 1 – capex 30 years	£6,000
Option 2 – one-off opex	£20,000
Option 3a – ongoing opex 30 years	£6,700
Option 3b – ongoing opex 80 years	£4,900

This table demonstrates that, in this case, the company would choose the one-off opex over the other two options as it would increase the company's pre-tax profit by at least £13,300. As the expenditure is outperformance, this implies that the company would choose to outperform in one-off opex opposed to capex.

Although the company would choose option 2, we recognise that this may not always be available. In this case, then the result shows that it is less clear cut which option the company would choose. This is because it depends on the assumptions used in option 3 relating to the length of the analysis. As the incentives are applied at the programme level the reality is that the answer is probably more aligned with option 3b.

Other factors that will influence these results are:

- the effect of the opex roller multiplier that we give to those companies at or close to the frontier (those companies that are considered the most efficient);
- the CIS ratio. Previous examples assume a central ratio of 30%, but, depending on the regulator's decision and the plan that the company submitted at the price review, these ratios range from 15-40%; and
- whether a company is inefficient.

The tables below show the impact of these incentives.

Table 4 Change in NPV of a regulated company given the wider incentives effecting capex options

	Benefit to company, shown as NPV
Option 1a – capex median CIS baseline (100)	£6,000
Option 1b – capex high CIS baseline (130+)	£3,000
Option 1c – capex low CIS baseline (80-)	£9,000

Table 5 Change in NPV of a regulated company given the wider incentives effecting opex options

	Benefit to company, shown as NPV	Benefit to co. receiving maximum opex rolling multiplier, shown as NPV	Benefit to inefficient company, shown as NPV[7]
Option 2 – one-off opex	£20,000	£20,000	£20,000
Option 3a – ongoing opex, PV neutral over 30 years	£6,700	£10,100	£8,400
Option 3b – ongoing opex, PV neutral over 80 years	£4,900	£7,400	£6,700

Table 4 shows how the company would benefit from outperforming the capex assumed in price limits given the range of possible CIS baselines.

Option 1b assumes the same scenario as option 1a, but the company receives a CIS baseline of 130+ instead of 100, which allows it to retain 15% of outperformance instead of 30%. We recognise that this option simplifies the CIS and does not take into account the incentives on the company to submit robust business plans. But the effect of the change in baseline is to decrease the profit from a net present value of £6,000 to £3,000.

Compared with either option 3a or 3b, the company would now choose to outperform in ongoing opex rather than capex. This option creates a preference to invest in capex. On the other hand, if a baseline below 100 is applied, the effect will be to increase the preference to outperform in capex. This is an opex bias.

But table 5 shows how the benefits to the company would change under a range of assumptions relating to opex outperformance. The second column shows the maximum effect of the opex roller multiplier, which would apply to an efficient company at the frontier. The maximum opex roller effectively increases the retention period for the company from six to nine years. The effect of this incentive is to increase the profit for outperformance. So, applying the multiplier could create a preference to outperform in opex.

[7] This analysis assumes the company was an upper B band. The NPV amount shown includes the benefit of avoided losses to profits because of price limits not including all of the company's base year costs.

The third column in this table shows how the results change for an inefficient company. As with the underperformance scenario, this analysis also assumes a continuous relative efficiency measure – when, in reality, the companies are placed in bands. The same issues relating to sensitivity apply. This scenario is a more common across the water and sewerage sectors, but it is worth noting that the analysis includes avoided losses because price limits do not include all the company's base year costs.

The results in tables 4 and 5 show that under different circumstances an opex or a capex bias may exist. These scenarios can also be used to model different situations or choices between a company's investments. For example, if spending capex enables a company to outperform the opex assumptions included in price limits, analysis of choices highlights that issues exist if options include one-off opex. But the impacts are much more marginal when this type of expenditure is excluded and range between an opex bias and a capex bias, although a tendency towards a capex bias is present.

Other factors that can influence a company's choice between the options outlined above for incurring expenditure include:

- differences between the allowed and actual costs of capital;
- whether the expenditure is incurred in the price control period;
- the level of the discount rate. By changing these assumptions, it is possible to change the relative attractiveness of the options; and
- the likelihood that the regulator will allow ongoing opex and existing capex into the company's revenues for the next control period. If the company is not sure about this, options that require adjustment of revenues in this way are much less attractive.

We have tested how these factors could influence the results presented in this chapter. While most of the factors have a small impact, there are two areas in particular that stand out. The first is the companies' ability to achieve a lower cost of capital than we assumed when we set price limits. This has the effect of increasing profits from outperforming the amount of capex assumed in price limits and reducing losses of underperforming. So, the effect is to increase the likelihood of an opex bias for outperformance and reinforce the capex bias observed for underperformance. In assessing this impact on the option appraisal outlined above, we have assumed that where the companies achieve financing efficiencies during a control period, we take these into account in setting the cost of capital at future price reviews.

These results show that there is an increased likelihood of opex bias when outperforming capex and achieving a lower cost of capital than assumed in price

limits. But, this effect is likely to be mitigated by the longer-run incentive we describe in section 2.4 to grow the RCV and achieve profits because of the potential to outperform the cost of capital.

The second factor that stands out is waiting until the fifth year to underperform in re-occurring opex. This has a negative impact on profits and is linked to the relative efficiency assessment. Despite the company not incurring the expenditure in the fourth year and so causing an improvement on the relative efficiency score, the company is still worse off. This is because the expenditure in the fourth year is also used as the base year for assessing the operational expenditure in the following control period.

A2.3 Different types of expenditure

We have based the analysis outlined above on the investment being above-ground enhancement. There are also three other categories of expenditure.

- Below-ground enhancement.
- Below-ground maintenance.
- Above-ground maintenance.

Although our framework uses different methods for remunerating the categories of expenditure, this does not affect the result presented in this appendix as the CIS mechanism is applied to all categories.

Despite this, it is likely that the different categories do influence the companies' business plans and levels of outperformance because of levels of risk aversion.

Appendix 3: Ideas for addressing capex bias within future price limits

A3.1 Option 1 – equalising the rate of return

In chapter 2, we said that outperforming the assumed cost of capital was one of the factors that had an impact on capex bias. This may be because when they assess their duties in relation to both the short and long term, regulators may aim up on the cost of capital to secure that efficient companies can finance their functions. This is because the risk of underestimating the cost of capital is much more significant as it could result in companies failing financially.

Aiming up has the effect of transferring part of the risk of revenue allowances being too low from company to customers in order to reduce the longer-term risk to customers. For example, we acknowledged the risk to customers of making too low a cost of capital assumption given the market conditions in our final determinations of price limits at PR09.

One way of removing this influence would be for us to set the allowed rate of return so that it equals the regulated company's actual cost of capital (for example, a form of control similar to rate of return regulation).

A refinement of this option is an earning sharing framework. This is an extension of rate of return regulation where the operator keeps a portion of the earnings it receives in excess of (and in some cases below) a given level. The remainder must go back to customers, through:

- future price reductions;
- refunds; or
- increased investment in facilities or services.

In theory, these approaches could be designed for a company to be indifferent to having a preference between capex and opex. The only way the company could make profits significantly in excess of its allowed rate of return could be for it to spend less than its allowance, either by improving its efficiency or by reducing its quality of service (within allowed limits).

While none of the companies suggested this option directly, some said that we should consider reviewing the way we estimate the rate of return.

This section considers the advantages and disadvantages of equalising the rate of return between that allowed in price setting and that actually achieved by a

company. Our forthcoming document on the role of the cost of capital and risk mitigants will consider the issues around how we set the rate of return in price setting in more detail.

A3.1.1 Advantages

In theory, the companies we regulate could be incentivised to be indifferent between opex and capex solutions. This could result in them making the most efficient whole-life cost solutions that would benefit customers in the long term.

In 'Future price limits – form of control and regulated/unregulated business', Frontier Economics noted that a rate of return regulatory approach may result in lower financing risk than under the existing incentive-based framework, as the firm will earn revenue on any investments made.

A3.1.2 Disadvantages

An approach where the companies are remunerated based on their actual financing costs is not compatible with an incentive-based regulatory framework where they benefit from financing efficiencies realised. It may reduce the incentive on management to look for innovative financing solutions, the benefits of which are passed on to customers in the future. Frontier Economics also suggested that a rate of return regulatory framework can lead to different outcomes (when compared with a price or revenue cap) that can limit the incentive on a regulated company to become more efficient and encourage it to over-invest.

In addition, if we were to set a target rate of return, or to remunerate actual achieved returns, we may have to set a cost of capital that reflects each company's financial structure. This would be inconsistent with the view we set out in our discussion document on financeability and financing the asset base that investors and the companies bear the risks associated with their choice of financial structure.

So, rate of return regulation will not necessarily encourage efficient investment. An alternative approach, using an earning sharing framework may have stronger productive efficiency incentive properties than simple rate of return frameworks. But these will still be weaker incentives than in a formal price cap framework. Frontier Economics suggested that sharing approaches do not satisfy the principle of allocative efficiency as well as the rate of return regulation, since price levels can depart from the underlying cost levels.

This approach will not solve all the problems because of other influences that may drive a bias. If the capex bias exists, for example, it may still be prevalent in business planning, option appraisal, or as a result of management incentives.

A3.2 Option 2 – a return on operating expenditure

Some companies have suggested that they should be allowed a return on opex, to counterbalance a bias towards capex. This could imply an overall return made up of a 'margin' and a conventional return on capital. But it is not clear how such a return could be calculated in practice, nor how it would be consistent with our primary legal duty to protect the interests of consumers. Since the companies are reimbursed for opex as they incur it, there is no further cost to reimburse, unlike the return on capital, which represents the costs of raising finance that is repaid over a long period.

It would also imply higher prices for customers if the companies earn a return on both capex and opex. One way of mitigating this might be to adjust the return on capital estimated at the price review, so that the company is, in theory, present value neutral to the change. Using this approach, there is potential to:

- calculate a different return for different companies; or
- to use one number across the water and sewerage sectors.

A different return could be used to reflect the various cost structures across the sectors, for example where opex is a greater proportion of revenues.

This could apply either to:

- all opex; or
- only opex incurred during the price control period, which was unanticipated at the review.

But allowing a return only on expenditure incurred during the price control period might encourage the companies to submit forecasts at the review period that exclude some likely items of opex, in the hope that they could incur those during the control period, and be allowed a return on the associated expenditure.

Some of the companies put forward this option. It is not clear whether they consider that a return on opex would be an additional revenue allowance for them, rather than a replacement for part of the existing return on capital expenditure.

A3.2.1 Advantages

Increasing the attractiveness of incurring opex could reduce incentives to incur capex. But this is dependent on setting the return on opex at an appropriate level.

Implementing a return on opex would also be relatively simple. It would involve changing the modelling done at price control reviews slightly, but it would not necessitate the design of new and complex regulatory mechanisms.

A3.2.2 Disadvantages

If an aim of economic regulation is to mimic competitive markets as closely as possible, it seems unlikely that a return on opex would be appropriate. It is not clear that such a return is observed in competitive markets in capital-intensive industries.

There is no obvious way to determine the level at which the return on opex should be set. Companies in competitive service industries must earn sufficient profit to compensate their investors. But there are few precedents for such a return in other regulated industries, and we are not aware of any economic theory that could help in estimating it. The nearest equivalent is the return on turnover, or operating margin, observed in the price controls of the energy supply businesses, although it is a far from perfect parallel. OFFER, and then Ofgem, set a control in this way since energy suppliers (like many retail businesses) have little capital and a return on the companies' RCV is not appropriate as a result. It did not allow the companies an operating margin in order to supplement the return on RCV.

Also, if it is set at an inappropriate level, a return on opex could lead to perverse incentives of its own.

- If it is set too high, it could simply increase the preference for opex, leading to windfall gains for the companies at the expense of customers.
- If it is set too low, it will not reduce the preference for capex.
- If it is set at the same level across the sectors, companies with significant legitimate capex investment programmes or capex bias problems could find the funded return inadequate, while those without such problems could gain a return on expenditure in exchange for no benefit for their customers.

If the company's return is allowed only on opex incurred during the control period, it might give the company an incentive to conceal necessary opex during the price review. But if the return is allowed on all opex, the company could achieve significant windfall gains, unless its return on capital expenditure is reduced accordingly.

A3.3 Option 3 – scrutinising capex more intensively

With the introduction of the CIS any capex unanticipated at the price review but incurred during the control period is included in the RCV following the next review. This expenditure would receive a penalty through the CIS mechanism. In theory, we could analyse and disallow such expenditure if we found it to be inappropriate in

terms of a bias. This could be similar to approaches we applied before we introduced the CIS mechanism. If we increased the pressure on the companies to assess properly the scope and cost of their capital programme before allowing capex into the RCV at the next price review, it might incentivise them to explore solutions that involve opex instead.

In practice, we could implement this solution by requiring that each company carries out more detailed analyses than they do at present for each unanticipated capex project begun during the control period. In particular, such analysis should justify the project compared with other solutions that required more opex. We could then scrutinise this analysis in great detail, disallowing expenditure where appropriate. This approach would encourage the companies to ensure that their processes mitigate any problems caused by their structure or culture. It might also prevent the companies from capitalising expenditure inappropriately.

To some extent, we already do this using the IDoK and logging up mechanisms. Where these do not apply, unanticipated expenditure is also captured by the CIS incentive payment. So, this approach requires careful consideration alongside the development of risk mitigants and any incentive mechanisms, such as the CIS.

A3.3.1 Advantages

In principle, this option could mitigate the incentive the companies have to carry out inappropriate capex-intensive projects during the control period. It might also reduce the companies' ability to classify opex as capex inappropriately. But it would not reduce their incentives to do so, if they considered they were able to.

Customers might benefit from lower prices. This is because the companies would be able to recover a return on capex only on those projects that we considered justifiable. Any unjustifiable expenditure would not be financed by a return at the following review. But it is not clear if further scrutiny would be appropriate or desirable.

Compared with the first two options, this approach would avoid difficult judgements on rates of return. It would also build closely on current practice, and avoid the need to establish new and complicated regulatory mechanisms.

A3.3.2 Disadvantages

This option would not remove the incentives to reclassify capex as opex, or to propose capex-intensive projects at the price control review. Both we and the companies scrutinised intensively large capex projects at PR09. It may be that there is relatively little scope for doing more in this area. Returns on more intensive

scrutiny could already have diminished to the point that they are of minimal significance.

It is likely that some form of triviality, or de minimis, threshold would need to be applied, to reduce the number of capex projects that we should evaluate at a price review. This could be a similar approach to the 2% threshold that is currently in place for the change protocol and IDoKs. But we would need to consider an appropriate value for it. Having a threshold could mean the companies could break up larger projects into smaller components that cost less than the threshold. And in practice, policing it effectively would mean that we are likely to end up scrutinising many of the projects that we would like to exclude.

This option would not address the possible inconsistency of incentives caused by the operation of the benchmarking system. So, it would probably represent part of a remedial package.

It could also be that this option is less effective than might be expected. It relies to a considerable extent on the companies – which we assume know their own businesses – scoping projects and identifying options correctly, including those projects with significant opex components. But some companies may not even consider such options in the first place, particularly if they are still in engineering-led mindsets. This option would not address that bias of omission.

Finally, this option would result in a significant increase in the regulatory burden at price control reviews. It would not be compatible with our emerging risk-based approach, or our view that that the companies should own their own plans and engage with customers to deliver what they value and are willing to pay for.

A3.4 Option 4 – a customer pre-approval mechanism

When BAA wishes to carry out a significant capital expenditure project at one of its price-controlled airports, it must submit its plans to a committee of airlines (that is, retailers rather than end-consumers). This committee can suggest modifications to the project. At the last Stansted Airport price review, the Competition Commission considered recommending that airline pre-approval of capex projects be mandatory before these could be included in the RCV.

The proposals were never fully developed, but they probably would have involved some form of voting system so that the two largest airlines at Stansted (easyJet and Ryanair) could not dictate the development of the airport. This pre-approval would not have replaced the role of the CAA, which would still have had the final word on whether the projects would be included in the airport's RCV at the next price control

review. But in practice, it would have been significantly more difficult for the regulator to refuse to include projects in the RCV once the airlines had approved them.

Under a variant of this option, the regulated company could incur expenditure that its customers have refused to authorise, as well as authorised expenditure. But it would do so on the understanding that the regulator could refuse to allow the capex into the RCV at the next price control review if it turns out to be unjustified. There could also be implications for the recovery of opex. It would be possible to introduce a triviality or de minimis threshold for smaller projects, below which consultation would not be necessary. But it would also be necessary to ensure that the company did not evade this requirement. As we discussed in option 3, a similar threshold (of 2%) already operates elsewhere in the water industry price controls.

A3.4.1 Advantages

We are already considering how customers should be engaged in the price limit setting process as part of our future price limits project. We want the companies to consider properly demand-side or operating solutions as alternatives to capital solutions when looking at how customers' desired outcomes could be delivered efficiently and sustainably. We envisage a process in which customers and other stakeholders are able to challenge the companies to develop best value proposals. But we do not propose to introduce more formal constructive engagement at this stage.

Effective engagement needs to be an ongoing process, particularly if demand-side approaches are to be developed and implemented. At price reviews, customers (or their representatives, perhaps including retailers) could review large investment projects and question whether they are appropriate. They could also ask whether the aims of the projects could be better achieved with less capital-intensive solutions. The Environment Agency has found such engagement – for example, in flood defence works – can deliver savings and better customer experience.

Such approaches could also be applied to issues that emerge and require new investment between price reviews. Any decision by the regulator on whether and how to remunerate such expenditure could be informed by or based on the extent of customer/stakeholder agreement.

A process of customer assurance or agreement could thus help to mitigate any capex bias and allow the regulator to focus more its efforts more effectively (for example, on projects that customers do not regard as good value).

Effective engagement with customers and stakeholders will help to deliver legitimate outcomes that are accepted as offering value for money. This increased legitimacy will support the long-term social and financial sustainability of the sectors.

A3.4.2 Disadvantages

The main disadvantage that the CAA identified with the constructive engagement approach was that large incumbent airlines might use the pre-approval mechanism to block improvements that could benefit possible future competitors. This could also be a potential issue in the water and sewerage sectors. Developing a distribution network, for example, might facilitate new retail entrants.

But there are other reasons why this approach may not be appropriate. A formal approach would entail significant commitment of resources by those representing customers in any formal discussions. At the moment, there is not a well-developed retail market in the water or sewerage sectors that could represent customers' interests in any negotiation. This may develop over time if the UK Government liberalises retail activity in the sectors and we do not rule out a constructive engagement approach in the future.

Finally, we would need to strike the right balance between existing customers' interests, as reflected by any pre-approvals, and the interests of customers and wider society over the long term. This might lead us to make decisions that although the companies had regard to existing customers' pre-approval, they did not agree with them.

We discuss these issues further in 'Involving customers in decisions about water and sewerage services', which we published in April 2011.

A3.5 Option 5 – a regulatory pre-approval mechanism

This option is similar to option 4. It envisages that capex projects are not allowed to enter the RCV without approval, but in this case it is the regulator that directly approves them, rather than the company's customers. The regulator could apply this approach for any unanticipated expenditure between price reviews, and in more depth than we have used previously during the price setting process.

The companies would be required to submit the same detailed justification as is the case with option 4, and the same list of alternatives and reasons why its management has rejected them. One company has likened this to the approach to the water resources management plans, where they are required to submit a list of options considered. Again, it is likely that this pre-approval mechanism could be subject to some form of de minimis threshold, whereby projects under a certain size were exempt.

Under such an approach, it may be possible for the regulated company to incur capex between reviews that the regulator refuses to authorise. It could do so on the understanding that:

- the regulator refuses to allow the expenditure into the RCV at the next price control review if it turns out to be unjustified;
- the expenditure is subject to some form of penalty, as applied within the CIS (or a comparable incentive); or
- a combination of the above.

A3.5.1 Advantages

One advantage of this approach is that the regulator could determine beforehand whether the project is consistent with its legal duties. If the regulator has sufficient knowledge and resources to evaluate all the projects and their alternatives robustly, it could also reduce a preference for capex. It would not be particularly burdensome to the companies, most of which would, or should, create the documentation required by this approach in any case.

Another advantage is that regulatory pre-approval of capex should, like customer pre-approval, make it more certain that the companies will be able to recover their expenditure. This is because having shared details of feasible options would make it less likely that the companies would incur capex that they consider inappropriate. So, it should reduce their level of business risk and their cost of capital. Some or all of the savings from this can be passed back to customers at the next price review.

Finally, it could be argued that this mechanism mimics competitive markets to some extent with the regulator taking the place of the monopoly customers in acting as a proxy for customers in competitive markets.

A3.5.2 Disadvantages

The main disadvantage of this option is that it would require significant intervention by the regulator in the way in which a company would achieve the outcomes that its customers and wider society value. Arguably, it would not be consistent with our move to more outcome-focused regulation. We would also need to ensure that the way in which we scrutinised company proposals was in line with the risk-based approach that we are developing as part of our regulatory compliance project.

Also, the cost of compliance for the companies and the regulator might be significant, although the total cost depends on how we implement this option, and the extent to which it differs from the current approach. Ultimately, customers will fund most, if not all, of these costs.

We could choose to apply this approach in a targeted way – asking only for details of the potential options in areas that have a large impact on customers' bills or that have been identified as likely to be prone to a capex bias.

A3.6 Option 6 – a totex cost recovery approach

In this approach, the regulator attempts to incentivise the company to treat actual opex and capex the same by fixing in advance the ratio between them that it will assume in setting revenues either at the upcoming price review for planned expenditure or at the following price review for unanticipated expenditure. For example, it may announce that it will treat expenditure as 80% opex and 20% capex, whether the company incurred 100% opex or 100% capex, or some ratio in between.

Since the ratio is fixed in advance, the company's revenues are insensitive to the actual split between opex and capex. So, the company can make decisions on which type of expenditure to incur without considering how its decision will affect its price controlled revenues, although – like a company in a competitive industry – it will still need to consider how its decision will affect its costs or quality of service.

Ofgem followed this approach at its last distribution price control review. It fixed the proportion of central costs to be treated as opex at 100%, while treating 85% of the remainder of the costs as capex and the other 15% as opex. Ofgem based the 85% proportion on the total ratio of opex to capex at the previous price control review. Originally, it contemplated setting different ratios for each distribution business, but in the end set the same ratio to cover all of them.

But, we may consider estimating appropriate ratios for the water and sewerage sectors. This is because there is no reason to suppose that ratios that are appropriate in the electricity sector will be suitable for water and sewerage. This is especially relevant as the ratios could also vary for different points of the value chain (as might the usefulness of this approach more generally). We would also need to consider whether the ratio should be different for individual companies and so allow us to reflect issues such as how legislative drivers affect companies differently.

Ofgem has also combined this approach with a menu incentive, which we discuss in more detail in option 7 below.

A3.6.1 Advantages

In theory, this approach could eliminate a preference for capex because of the regulatory framework in place. Since the proportion of expenditure that is treated as capex is fixed, the regulated company should be indifferent in deciding between incurring a certain sum of capex and the same sum of opex.

The approach also seems to be relatively simple to adopt and administer. It involves a regulatory decision on the ratio of expenditure to be treated as opex at the price control review, and then no further action, unless the companies dispute the ratios.

A3.6.2 Disadvantages

Even under a totex approach, the companies may still have an incentive to treat projects as capex rather than opex. In particular, this would apply if the ratio of capex to opex is determined on a company-by-company basis, and if it the company expects that the regulator will revisit this ratio at the next price review taking account of the outturn ratios of capex to opex during the price control review period. In this way, if the company incurs as much capex as possible, it may be rewarded with a higher ratio at the next price review. This incentive would be diluted if the same ratio were applied across all the appointed companies and/or were fixed over time.

But there is a disadvantage to fixing a single ratio. It would be impossible to allow for the likelihood that the companies' circumstances differ substantially. The proportion of capex to opex projected at the last price review could vary significantly from company to company. Allowing some companies higher proportions of capex than they are likely to incur could allow them unnecessarily large returns, to the disadvantage of customers. Other companies could be allocated too low a proportion of capex, possibly causing them problems in financing necessary investment.

The determination of the ratio would probably be contentious. For example, basing it on the ratio at the last price control period could mean that it is inappropriate to use at the next price review because of changing legal, regulatory or technological requirements, or economic circumstances. Equally, attempting to forecast the ratio for the forthcoming control period at the price review would involve the risk of error.

But price reviews routinely involve subjective judgements and forecasting. Ofgem's use of this approach clearly indicates that the difficulties associated with it are not insurmountable, although given how recently it was introduced, it cannot yet be clear whether it is having the desired effect.

A3.7 Option 7 – an enhanced menu regulation incentive

We introduced a form of menu regulation – the capital expenditure incentive scheme (CIS) at PR09. The aim was to give the companies incentives to forecast their capital programmes accurately and manage them efficiently. While these are complicated in detail, the principle is relatively simple. We reward or penalise the companies after the price control by allowing them to retain fixed portions of capital expenditure savings or unanticipated expenditure.

This option has several variants. These are to:

- enhance the existing CIS;
- introduce a similar menu for opex; and
- introduce a totex menu approach.

The first option involves increasing the incentives on the companies to achieve savings in their capital expenditure budgets to reduce a preference for capex. In other words, if the CIS gives the companies an incentive to reduce capex during the price control periods, sharpening those incentives should incentivise them to consider projects that involve opex, and their managements not to dismiss them because they are operating, rather than engineering, solutions.

In theory, we could achieve a similar effect by reducing the incentives on the companies to achieve operating savings. This would increase the relative attractiveness of solutions involving opex. The aim of this would be to rebalance the relative strength of the incentives, rather than the absolute position. This emphasises the importance of considering incentives on expenditure as a whole, rather than on capex in isolation.

The second and third options involve extending the incentive to cover opex. The difference is whether there is a separate menu incentive for opex or whether the total expenditure is combined within one menu to create a totex menu.

Several companies have suggested to us that we should enhance the existing CIS by increasing the rewards for outperformance. It is not clear whether they have also considered an increase in the penalty for underperformance.

During our discussions, four companies suggested either a totex menu or a totex menu combined with a totex cost recovery approach. They suggested that:

- a totex approach would avoid the problems such as potentially lower opex efficiency bands because spend on commissioning debt collectors;
- introducing a totex approach would get away from issues like pensions adjustments being required for opex; and
- it would be easier to explain totex to investors as the differences between published accounts and regulatory accounts in terms of opex/capex allocations are not transparent to company boards and shareholders.

But one company also questioned whether a totex approach would work with long-term opex because of the uncertainty associated with it.

Whether or not we continue and/or extend menu regulation incentives, it will be important to ensure that our approach to reducing the preference for capex is consistent with our approach to menu regulation, if applied.

A3.7.1 Advantages

This option would address the problem of a preference for capex in two ways.

- It would incentivise the companies to forecast their expenditure accurately. Because of the CIS, this incentive should already exist for capex. But it has the potential to allow the companies greater flexibility if it is applied to opex.
- It would allow the companies to manage their expenditure efficiently by altering the relative strength of the incentives on them to under- or overperform. During the control period, the companies would be incentivised to make the reductions in expenditure themselves, so no additional regulatory oversight would be required.

This option would involve no complicated additional regulatory mechanism. It builds on a scheme that we have already implemented. Ofgem also uses this approach in its regulation of the energy sectors, but it is too early to judge whether or not it has been effective.

A totex menu would have the additional advantage of removing the regulatory separation between the two categories. This would increase company flexibility by not differentiating between capex and opex.

A3.7.2 Disadvantages

As yet, it is unclear how the companies have responded to the CIS. We would need to understand more before we sharpen the incentives within it.

But, in altering the incentives of a menu approach, we would need to guard against indirectly undermining its original aim, which was to reveal information and to incentivise the companies to avoid over-scoping their investment programmes. Also, within a totex menu it would be difficult for regulator to address the effects of wider drivers (possibly beyond the economic regulatory framework) that could be creating a bias by applying differing strength incentives.

We would also need to consider whether an enhanced menu should be set at the same level for each of the regulated companies, or whether it should vary. Varying it by company would mean that we could differentiate incentives between those that have displayed capex bias in the past and those that have not. In any case, we would need to consider carefully how large the differential should be.

Third, it is not clear whether the incentives should be symmetrical across all types of expenditure. For example, is it appropriate to include the same level of penalties where the expenditure is outside of the companies' control?

In the way Ofgem applies the menu incentive there is still a need to assess a baseline estimate of an efficient cost for each company. A further point is that not all expenditure has been applied to the menu and a significant amount has been assessed separately.

A3.8 Option 8 – adjusting Ofwat's operating expenditure and capital expenditure benchmarking and cost assessment mechanisms

This option focuses on removing three of the drivers of capex bias we identified in section 2.4.

- The first is that water companies perceive that there is a stronger incentive to reduce opex than capex through the approach we have taken historically to benchmarking. Some companies have confirmed this anecdotally, although the analysis in appendix 2 suggests that this is not always the case.
- The second driver is the differences in the timings and approach to cost assessment.
- The third driver is the regulatory separation of opex and capex.

We are revisiting these mechanisms as part of the work we are carrying out on cost assessment and cost recovery. But we do not yet have clear options for how we might adjust our approach. We will also review whether it is appropriate to move to a consistent approach to both opex and capex in whether it is top-down or bottom-up, and an ex-ante or an ex-post assessment.

When we review the mechanisms, we need to be mindful of the incentive effects of whatever possible adjustments on the trade-off between capex and opex, as well as the effects on them separately. One option we will explore is the totex approach to cost assessment and whether this is plausible. There is a clear link between this and option 7, which is a suggested totex approach to cost recovery and incentives.

It is clear from the discussions we have had with the companies that they – and their Boards – do not always understand the intricacies of the incentives we put in place. This can result in the companies focusing their attention on areas that are more readily understood. We will consider simplifying incentives as part of our review.

A3.8.1 Advantages

This option could involve no additional, complicated regulatory mechanism. It could modify (or extend) and simplify mechanisms already in place. We would implement it on the basis of the review of our benchmarking mechanisms that we are already conducting.

This approach also has the potential to remove the regulatory separation of opex and capex in cost assessment, and – as a result – the potential for differential treatment between them. If this differential treatment does not exist, then the incentives to misclassify expenditure will also be mitigated.

A3.8.2 Disadvantages

When we consider the details of this option, we would need to consider carefully how any changes we make to benchmarking or the cost assessment mechanisms would interact with the other incentive effects of the proposals. Changes to the benchmarking mechanism – for example, to reduce the incentive to make operating expenditure savings – might cause total expenditure to be higher. On the other hand, increasing the incentives to make savings on the investment programmes might jeopardise the companies' abilities to fund the investments necessary to meet environmental standards or service quality targets.

As with other options highlighted above, we would need to consider whether we should design benchmarking mechanisms on the same basis for all companies, or whether tailored benchmarking incentives should apply to each company. If the former, then we would treat companies with very different circumstances in a similar manner. The latter alternative could result in a significant increase in the time spent on this mechanism at price control reviews. We would also need to guard against designing our incentives in ways that ossify current industry structure and perhaps give insufficient incentives for efficiency-enhancing changes to that structure.

A3.9 Option 9 – changing retention mechanisms for operating expenditure and capital expenditure savings

At the moment, we allow the companies to retain unanticipated opex savings for six years. In chapter 2, we compared this with the level of incentive retention built into the CIS. This analysis showed that effectively lengthening the retention period of operating expenditure savings through the opex rolling incentive multiplier increased the preference for capex. It was clear that the interaction with the CIS incentives depended on whether there was a preference for opex or capex.

If there is a preference for capex, and if we wished to reduce that preference, one approach would be to shorten the time for which opex savings can be retained, returning the ongoing benefit of those savings to customers at an earlier date. We might be able to achieve a similar effect by lengthening the period for which capex savings may be retained relative to those for opex. This is because what counts are relative – rather than absolute – incentives.

We could also change the proportion of opex or capex savings that outperforming companies can retain, increasing the proportion of capex savings that they retain relative to the proportion of opex savings they retain. At the moment, the companies with the best opex performance may retain 150% of any savings made for six years. Reducing this proportion could incentivise the companies to seek opex-intensive solutions. We would have to consider any approach to the retention of savings alongside the incentives to include optimal expenditure in business plans at price controls.

During our discussions on incentives, a couple of the companies suggested increasing the retention of opex outperformance.

A3.9.1 Advantages

In principle, this option could resolve the problem of capex bias by making reducing capital expenditure more attractive. We could incentivise the companies to seek more opex-intensive solutions. No new or novel regulatory mechanism would be required.

This approach could also be applied regardless of the driver of capex bias. So, we could use this incentive to over-correct for bias even if we consider that other factors (such as company culture) are driving bias.

A3.9.2 Disadvantages

This option would incentivise the companies to reduce capex, whether or not appropriate alternatives are available. The lower the degree of substitutability of capex and opex in the water and sewerage sectors, the greater the extent to which this option may be an unduly blunt instrument.

If we decide to reduce incentives for opex efficiency, rather than increasing incentives to capex efficiency, we would need somehow to guard against an adverse impact on companies' operating performance.

This option would not directly address capex bias in the form of capitalisation policies. Nor would it directly address drivers of capex bias stemming from our approach to benchmarking. But it could address these issues indirectly by rewarding the companies more for reducing their capex.

Although this option would effectively increase incentives for capex outperformance, implementing it may also increase incentives to over-scope capex programmes in the companies' business plans. So, we may need to address this.

A3.10 Option 10 – a procedural incentive

The companies have suggested that a preference for capex could arise from the separation of operational and capital decisions in company structures. This implies that, even with a neutral regulatory framework, there is potential for bias because of a lack of information co-ordination and challenge within the companies. Introducing a procedural incentive that rewards those companies that think more widely and join up their decisions would be one way to solve this. This could reward the companies that generate innovative solutions, join up decisions on opex and capex and engage with customers, for example to develop alternative (asset-light) solutions and demonstrate this.

We could also use this option in conjunction with horizontal audits that compare company approaches. Or we could consider more in-depth options (such as options 3 or 5) where a company does not appear to be exploring options effectively.

A3.10.1 Advantages

The options described above focus on the regulatory framework. But we have already indicated in chapters 2 and 3 that some of the drivers are outside of this arena and more within the control of companies. This incentive would aim to tackle company issues at source.

Our work on incentives suggests that non-financial incentives can be very powerful. This type of incentive has the potential to be linked to the risk-based approach to regulation that we are developing. Here, we could apply a more proportionate approach to the to companies that we assess as low risk in terms of their delivery for customers and society, or to areas we assess as low risk. This could create a further reputational incentive on the companies to improve their performance as a means of establishing that they are low risk.

This approach could be considered to be a more proportionate alternative to option 3.

A3.10.2 Disadvantages

As this option focuses on company behaviour, it does not tackle any bias that may be inherent in the regulatory framework. But it may be possible to design the incentive to penalise companies that deliberately increase capex because of the regulatory framework, as well as because of any cultural or internal process bias.

For high-risk companies and areas, we might need to apply a higher degree of scrutiny than we do now. The extent to which this approach actually leads to a reduction in the regulatory burden would depend on how the companies responded to the procedural incentive. If there were a widespread failure to respond, we could end up applying a higher degree of scrutiny than we do now.

A3.11 Option 11 – outcome(s)-based incentive

In chapter 2, we identified several drivers that could limit the companies' choice between opex and capex. These include the separation of opex and capex by both us and the companies and the size of penalties influencing risk-averse behaviour.

An outcome-focused approach to regulation would see us incentivise the companies to deliver the outcomes that their customers and wider society value, and to do so efficiently. We outlined such an approach in 'Inputs, outputs and outcomes – what should price limits deliver?', which we published March 2011. In doing this, we would focus much less on holding the companies to account for delivering defined outputs. Instead, we would expect the companies to understand the outcomes they sought to deliver, and to take a balanced mature approach to risk in achieving them. This would mean that they would be less constrained in their approach to specific situations.

A3.11.1 Advantages

We are already considering this approach as part of our future price limits project. By setting the outcomes at a high level, the need to review solutions at an asset level is reduced. Removing the focus from the individual asset level investment to outcome incentives and a key performance indicator (KPI) based on outcomes would free the companies to choose between capex and opex solutions within the control period. This should also help to facilitate more innovation.

A3.11.2 Disadvantages

Depending on how this assessment was made and how the assumptions about capex and opex fed into cost recovery, the companies may still face incentives to favour capital solutions in their business plans. Although an outcome-focused approach would free the companies up to consider opex solutions to a great extent in a control period, the revenue requirement underpinning price limits would still need to be determined on the basis of assumptions about what would be needed to deliver the relevant outcomes.

While it could address some aspects of the regulatory framework that might contribute to capex bias, this approach might not address others. For example, it

would still be possible for risk-averse companies to favour capex where they perceive it is offering greater certainty of outcome-delivery.

A3.12 Option 12 – the status quo

The status quo of regulatory measures influencing capex preferences in the water and sewerage sectors in this context comprises:

- the current capex and opex incentive schemes;
- the present mechanisms for cost assessment, including benchmarking the companies' expenditure performance;
- limited ex-post regulatory scrutiny of the companies' capital investment plans;
- a rate of return that could be different from the companies' actual cost of capital; and
- limited and moderate pre-approval mechanisms, involving either customers or the regulator.

Retaining the status quo could be appropriate if we were satisfied that:

- capex bias did not exist;
- it was insignificant or not problematic; or
- that any solutions identified would cause more problems than they solved.

It is important that we consider this option.

A3.12.1 Advantages

By leaving regulatory mechanisms or incentives unaltered, we would allow the changes, including the CIS to become established. This option would not involve us or the companies in incurring any additional expenditure or management effort in addressing capex bias. It would also avoid introducing additional perverse incentives, which could create outcomes contrary to our legal duties. Adopting this option would not increase perverse incentives under the current regulatory system.

A3.12.2 Disadvantages

Although some of the options above show how our regulatory framework could be adjusted, this one would do nothing to address such capex bias as may currently exist in the regulatory framework.

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We are responsible for making sure that the water and sewerage sectors in England and Wales provide customers with a good quality and efficient service at a fair price.

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