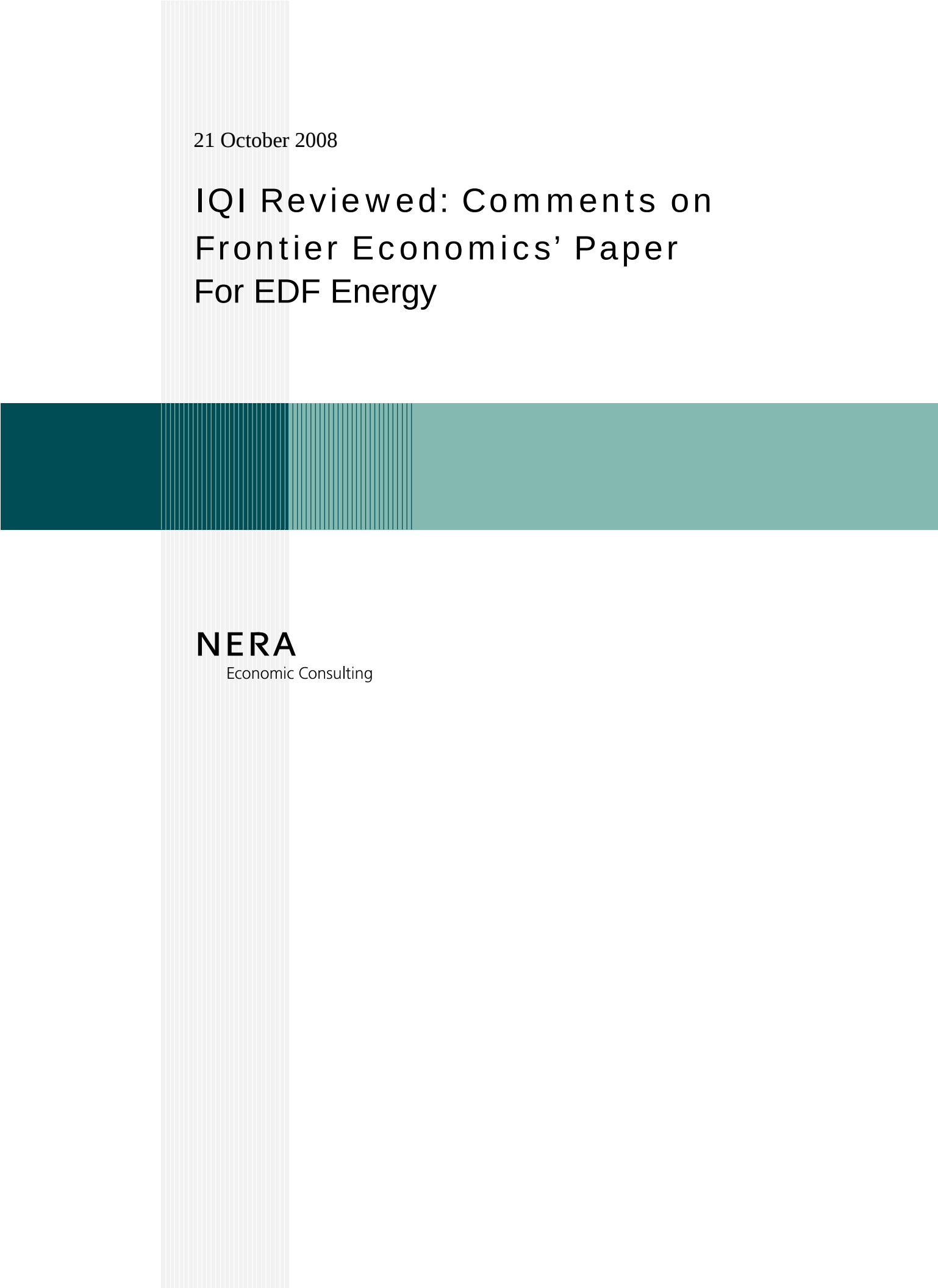


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IQI Reviewed: Comments on Frontier Economics' Paper For EDF Energy



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Executive Summary

Frontier Economics (FE) has written a paper entitled “The Information Quality Incentive Mechanism”.¹ CE Electric had asked FE to consider the strengths and weaknesses of the Information Quality Incentive (IQI), and to make suggestions for its future development. EDF Energy has now asked NERA to review this paper and the suggestions within it.

FE reviews experience from the first two years of the current regulatory period and concludes that the industry had so far under-spent its capex allowance by 18%.² FE sees this underspending as a problem due to some inadequacy in the IQI. FE proposes that the IQI should be amended to encourage lower forecasts and that Ofgem should review capital expenditure ex post, to claw back “unreasonable” levels of underspend. However:

- FE’s appraisal of experience is partial and naïve; two years is simply too short a period to support any firm conclusions about behaviour and FE overlooks or ignores several alternative explanations for the observed behaviour, thereby leaping to premature and unjustified conclusions; and
- FE’s proposals lack any economic underpinnings, being little more than wishful thinking about desired outcomes, that would introduce new levels of unpredictability into regulation, and FE does not describe any coherent regulatory system that would improve incentives.

The IQI does not reward DNOs for deliberately submitting forecasts below the expected level, or for deliberately over-forecasting capex with the intention of undercutting the forecast. Hence, underspending does *not* provide any evidence of deliberate over-forecasting. To mount its criticism of DNOs’ performance, FE therefore makes two tortuous arguments:

1. allowing DNOs to re-submit capex forecasts worked in their favour; and
2. risk aversion leads to biased and undesirable outcomes.

Neither of these arguments stands up to closer scrutiny. In the end, FE does not even recommend that Ofgem should prevent re-submission of capex forecasts. Instead, FE refers to an Ofwat scheme, but that scheme contains nothing that is not already part of Ofgem’s process. FE’s statements about risk aversion are mere assertions that lack substance or analytical support. FE says the IQI offers “cheap insurance” to DNOs whose capex is uncertain – but there is nothing wrong with offering cheap insurance in the face of uncertainty. FE recommends tilting incentives in favour of low capex forecasts. However, that recommendation runs contrary to the aim of the IQI – which is to encourage *accurate* forecasts. It therefore represents an entirely arbitrary reallocation of rewards and penalties which merely penalises the unlucky DNOs who face genuine uncertainty over capex.

Overall, FE’s paper is lacking in any analytical content. Certain DNOs may feel that they can anticipate their position in DPCR5 and may favour the outcomes proposed by FE. FE’s proposals may therefore attract support from some quarters. However, neither FE’s paper nor such partisan support for it provide any justification for taking action over the IQI.

¹ FE (2008), *The Information Quality Incentive Mechanism: A Paper Prepared for CE Electric*, August 2008.

² FE (2008), page 3.

1. Introduction

In August 2008, Frontier Economics (FE) wrote a paper entitled “The Information Quality Incentive Mechanism”.³ CE Electric had asked FE to consider the strengths and weaknesses of the Information Quality Incentive (IQI), and make suggestions for its future development. EDF Energy has now asked NERA to review this paper and the suggestions within it.

FE’s paper makes two separate suggestions. First, FE suggests that Ofgem should limit the freedom of DNOs to submit revised capex bids in DPCR5. Second, FE suggests that Ofgem should tilt the IQI matrix to provide a stronger reward for lower capex forecasts.

However, FE’s suggestions are based on a cursory review of recent experience and partial conclusions which are no more than assertions, some of which are clearly incorrect.

Below I review the various topics raised in the paper:

- Section 2 considers FE’s review of recent experience and the lessons learned from it;
- Section 3 discusses FE’s proposals to change regulatory incentives;
- Section 4 reviews FE’s discussion of the re-submission of capex forecasts;
- Section 5 sets out my conclusions.

³ FE (2008), *The Information Quality Incentive Mechanism: A Paper Prepared for CE Electric*, August 2008.

2. Review of Experience

FE's review of experience focuses on the chart on page 2, on the basis of which FE identifies (a) a tendency and (b) a problem. The alleged tendency is for DNOs to underspend their capex allowances, which FE expresses as follows:

“In aggregate, the industry has under-spent its allowance by 18% for the first two years of the control. While this gap may close over the remainder of the price control period, the scale of the under-spend to date is substantial.”⁴

The alleged problem arises from the underspends observed for companies whose forecasts differed the most from those of Ofgem's consultants, PB Power, about which FE says:

“Moreover, much of it has been achieved by the DNOs that produced the highest forecasts relative to PB Power. These outcomes suggest that the IQI has not completely solved the problems it was intended to.”⁵

Unfortunately, neither of these conclusions is supported by the evidence that FE presents.

2.1. Trend in Capital Expenditure

Two years is simply too little experience with which to judge whether there is over- or underspending relative to five-year capex allowances, which form the basis of the IQI. There are many possible reasons why expenditure may have been lower than the annual allowances in these years. FE mentions two possibilities on page 3 of its paper, namely

- “genuine efficiency improvements” and
- “not delivering some volume of investment activity”.

Later in the paper, FE itself identifies further reasons for underspend:⁶

- “genuine efficiency;
- an acceptance of higher operational risk; and/or
- excessive allowances due to forecast inflation or risk aversion.”

Further possibilities not considered in FE's paper include:

- Unit prices of investments being depressed in these years, relative to RPI; and
- DNOs taking time to ramp up their level of capex to the forecast levels.

The attempt to draw firm conclusions from two years' evidence is a major weakness in FE's paper. FE tries to raise alarm over an underspend of 18% in the first two years of the

⁴ FE (2008), page 3.

⁵ FE (2008), page 3.

⁶ FE (2008), page 7.

regulatory period. However, DNOs would only need to “overspend” by 12% on aggregate in the final three years to bring total capex back on budget. I understand from EDF Energy that the company’s own forecast of capex did indeed exhibit a rising trend in DPCR4, which Ofgem converted into a more even pattern of annual capex allowances. Some of these DNOs’ apparent “underspend” is therefore a product of Ofgem’s own “overforecasting” of their capex in the early years of the period.

However, FE does not consider any of these possibilities. Instead, the paper is predicated on the assumption that the observed underspend represents a problem because it is due to a tendency to over-forecast capex. Even this partial and biased conclusion cannot be supported without a tortuous and unsubstantiated explanation, since the IQI was set up specifically to discourage over-forecasting.

2.2. IQI Incentives for Over-Forecasting

FE describes the aim of the IQI as follows:

“Ofgem introduced the IQI at DPCR4 primarily to ‘encourage more realistic forecasts from the DNOs’ whilst also retaining good efficiency incentives.”⁷

Before deciding whether or not the IQI has achieved its aims, it must be recalled that in this sentence “more realistic” means “more accurate”, not “lower”. The IQI was set up to encourage DNOs to reveal an accurate forecast of capex, by setting incentives so that the DNO achieved the highest profits by doing so. The IQI does not reward DNOs for submitting an over-forecast *with the intention of undercutting it*. If the DNOs had expected to underspend their allowances over the whole five year period, they would have been better off submitting a lower forecast. Thus, even if the DNOs underspent over the whole five year period (and FE has no evidence to say that this will be the case), *that underspending would not provide evidence of deliberate over-forecasting*.

In order to sustain the case that companies deliberately over-forecast their capex (and that this over-forecast is somehow a problem for Ofgem), FE has to make two tortuous arguments:

1. somehow, allowing DNOs to re-submit capex forecasts worked in their favour; and
2. risk aversion leads to biased and undesirable outcomes.

Neither of these arguments stands up to closer scrutiny.

2.2.1. Re-Submission of capex forecasts

With regard to the submission of capex forecasts, FE’s presentation of the facts is incorrect and gives a misleading impression of the regulatory process and DNOs’ part in it. FE implies that DNOs submitted two sets of forecasts in order to influence the IQI. In fact, Ofgem first introduced the idea of the IQI in its initial proposals document of June 2004,⁸ i.e. some months *after* the DNOs had submitted their first capex forecasts. Ofgem only finalised the

⁷ FE (2008), page 1.

⁸ Ofgem (2004a), Electricity Distribution Price Control Review: Initial proposals, 145/04, June 2004, table 6.9

IQI matrix in its update of September 2004.⁹ Therefore, if the incentives in the IQI were to have any effect, Ofgem had to allow companies to re-submit their capex allowances after September 2004, taking the new incentives into account. Ofgem accepted updated capex forecasts in the final proposals document in December 2004.¹⁰

The re-submission of capex forecasts was not therefore an attempt to distort the IQI, but rather a necessary response to the publication of the IQI. FE is doing the reader a dis-service by presenting it as anything else.

2.2.2. Risk aversion

FE asserts (without providing any evidence to back its claim) that risk averse companies will submit capex forecasts that are higher than their expected level of capex, in order to provide a form of “cheap insurance”.¹¹

I constructed a version of Ofgem’s IQI with rows and columns for each percentage ratio (DNO / PB Power) from 90 to 140. I then considered a number of cases in which DNOs faced uncertainty over their actual level of capex. I found that a DNO’s optimal forecast would only deviate from the expected level if (1) the range of uncertainty was relatively wide and (2) if the DNOs were highly risk averse. However, even in these conditions, the impact of a five percent variation (+ or –) in capex was only to switch the forecast to the next available column (i.e. by one percentage point) and it took variation of +/- 40 percentage points to generate a shift of even two or three percentage points in DNO forecasts – a trivial change by comparison with the assumed degree of uncertainty in capex. Hence, even extreme conditions had a relatively small impact on allowances and incentives.

FE then suggests that the IQI should be redesigned to remove the impact of exogenous risks, such as variation in underlying (commodity) prices. This proposal is a rational response to factors which inject risk without strengthening incentives. However, FE also suggests that the IQI should be “recalibrated” to provide a greater reward for lower forecasts.¹² This recommendation does not follow from any analysis and suggests that FE reached its conclusion on non-analytical grounds.

As well as providing no evidence that this problem is likely to occur, FE has failed to establish that it is at all undesirable for a company facing genuine uncertainty over its future capex to react by forecasting above the expected level. As FE says, this approach may offer a risk averse DNO some cheap insurance – but there is nothing intrinsically wrong with cheap insurance. After all, the alternative may be more expensive.

⁹ Ofgem (2004b), Electricity Distribution Price Control Review: Update paper, September 2004, table 4.7.

¹⁰ Ofgem (2004c), Electricity Distribution Price Control Review: Final Proposals, 265/04, November 2004, tables 7.6 and 7.7, paragraph 7.79.

¹¹ FE (2008), page 4.

¹² FE (2008), page 6.

2.3. Appraisal of FE Arguments

The IQI is a tool for encouraging *accurate* forecasts, not *low* forecasts. No-one can presume that the forecasts of PB Power are intrinsically accurate – or else there would be no need for the IQI. If PB Power’s forecasts were always accurate, Ofgem could and should simply have adopted them as the allowance; one must therefore presume some potential for error in PB Power’s forecasts. The IQI gives DNOs an incentive to forecast their expected capex as accurately as possible (subject to the minimal adjustment for risk adjustment mentioned above). The ratio emerging from the comparison of DNO and PB Power forecasts is therefore a combination of forecasting errors made by the DNO and forecasting errors made by PB Power. FE has not shown that consumers would benefit in any way from tilting rewards in favour of DNOs whose forecasts happen to be close to those of PB Power. The result may simply be that consumers pay higher and unnecessary rewards to those companies.

Moreover, FE has not described the proposed tilting of incentives in any detail, but given FE’s criticisms of the IQI, it would presumably make “insurance” more expensive for DNOs that face genuine uncertainty. This seems to be an unjustifiable (and indeed) undesirable aim. I cannot imagine any regulatory objective that would punish regulated firms, or raise their costs, merely because they face genuine and irresolvable uncertainty over a forecast level of expenditure. There is no point tilting penalties in order to encourage lower forecasts *per se*, if those lower forecasts will by definition be less accurate. The only rational purpose of tilting incentives is to encourage more *accurate* forecasts.¹³ The effect of FE’s proposals appears therefore to be merely arbitrary:

- an increased penalty on the unlucky DNOs facing genuine uncertainty over future capex, thereby raising their costs of insurance; and
- an increased reward to the lucky DNOs for whom the capex forecast of Ofgem’s consultants is similar to their own most accurate capex forecast.

Certain DNOs may feel that they can anticipate their position in DPCR5 and may therefore favour this outcome, but such an arbitrary reallocation of rewards offers no benefit to consumers as a whole.

¹³ There is no justification for punishing DNOs just because their *most accurate* forecast happens to lie above the forecast of the regulator’s consultants.

3. Implications for Regulation

3.1. Incentives

FE claims¹⁴ that a risk averse DNO will, by submitting a higher capex forecast, select a lower incentive for cost reduction. FE concludes that risk aversion leads to lower productivity in the future and that the scheme should be tilted to overcome this tendency. However, leaving aside its failure to give any evidence that this phenomenon is significant, FE also fails to consider whether the lower incentive also has benefits by providing a degree of risk sharing.

It is a standard feature of contract negotiations that two parties may choose to sacrifice some incentives in order to agree a mutually beneficial redistribution of risk. In this case, FE has not considered the possibility that sharing more risks (by reducing the incentive rate) has benefits for consumers, because it reduces the amount of risk facing a DNO that is (by assumption) risk averse. Reducing the risk that such a DNO faces may decrease the rate of return demanded by investors and the cost of investment to consumers. FE has not considered such offsetting benefits at any point, nor how increasing the costs of risk to DNOs will affect consumers.

3.2. FE's Proposal

FE wants to tilt the system to *increase* rewards for reducing capex (thereby reducing the scope for risk sharing). However, elsewhere in its own paper, FE proposes that Ofgem should simultaneously *reduce* the rewards for reducing capex, in order to prevent unnecessary profits.¹⁵ These two proposals highlight the inevitable conflict between productive efficiency (which means letting companies keep additional profits from underspending) and allocative efficiency (which means keeping revenues in line with costs). FE tries to square this circle by suggesting that Ofgem should:

“undertake an ex post assessment of the conduct of DNOs who have simultaneously submitted the highest forecasts (relative to PB Power) and underspent their allowance by most. ... The purpose would be to assess whether the behaviour of the DNOs is so extreme as to be unreasonable.”¹⁶

This proposal does not offer any real regulatory solution to the conflict between productive and allocative efficiency. Instead, it merely brushes away the problem by assuming that an all-knowing regulator can exercise discretion in an accurate and predictable way. Unfortunately, this is not regulatory economics – it is wishful thinking and potentially harmful to consumers's interests.

FE does not explain how Ofgem would assess whether DNO behaviour is ‘extreme’, or what would be an “unreasonable” level of capital expenditure, or why Ofgem should focus on DNOs who submitted the highest forecasts. The difficulty of making any objective

¹⁴ FE (2008), page 4.

¹⁵ FE (2008), page 5.

¹⁶ FE (2008), page 5.

assessments of ‘extreme’ and ‘unreasonable’ behaviour should be apparent to all. If it were possible for Ofgem to define in advance the criteria by which such an assessment would be carried out, it would be possible to redefine levels of allowed capex in the IQI accordingly. The danger with using undefined criteria for an ex post assessment is that it merely creates regulatory risk, discourages investment and invalidates the incentives in the IQI anyway. At no point does FE consider how introducing more discretion into regulation will drive up the return on investment required by investors, and hence the cost of capital, and hence the prices that consumers must pay.

In any case, Ofgem has already started to carry out ex post assessments, in the form of a “prudence review” of wasteful or inefficient capex decisions. FE’s proposal to add a second layer to this ex post review would require the use of different criteria, or more likely an added layer of arbitrary decisions. Such procedures would run counter to all the principles of economic regulation.

FE’s suggestion that Ofgem should focus on DNOs with high capex forecasts relative to PB Power’s is just as arbitrary. According to FE, DNOs can influence the opinions of Ofgem’s consultants, but in that case *any* company – not just those with relatively high forecasts – may have submitted an over-forecast and then used it to persuade PB Power to raise their forecast. (If FE now denies this happened, then there is no basis for most of its concerns.) In any case, DNO forecasts may differ from PB Power’s forecasts because PB Power *underestimated* investment needs. The distance between the two forecasts is therefore not evidence of over-forecasting. In general, if FE wants Ofgem to check spending for signs of over-forecasting on a non-discriminatory basis, such ex post reviews would have to be applied to all DNOs.

3.3. Appraisal of FE’s Proposals

FE’s so-called proposals for changing regulatory methods are in practice nothing more than a statement of desired outcomes, devoid of any plan for achieving them. FE simply has not provided any coherent description of a regulatory system that would offer incentives for more efficient behaviour.

4. Re-Submissions

In the middle section of the paper, FE discusses the re-submission of capex forecasts. As explained above, it is hard to see how the DNOs' initial capex forecasts could have been a deliberate attempt to influence the IQI, given that Ofgem only introduced the IQI some time later. FE suggests that the early capex forecasts might have influenced the views of Ofgem's consultants.¹⁷ However, FE's acceptance that this influence could happen implies that the forecasts of PB Power were not objective or independent (a conclusion with which I would agree). This conclusion confirms that there is nothing to gain by tilting incentives in favour of *lower* capex forecasts (i.e. closer to those of Ofgem's consultants), but that the IQI is a tool for encouraging DNOs to submit more *accurate* capex forecasts (and that any incentives within the IQI are only intended to achieve that aim).

In any case, FE concludes that it would not be desirable to prevent re-submission, on the grounds that "such an approach is potentially costly since it eliminates the benefits of interaction and challenge".¹⁸ FE therefore recognises that DNOs and Ofgem's consultants can influence each other's views of capex forecasts through technical discussions, so any concern about the influence of a single submission seems overblown, to say the least.

Thus, despite all statements in the paper implying that re-submission was a problem in itself, FE does not actually see re-submission as undesirable, or wish to prevent resubmission of capex forecasts in the future.

4.1. Discussion of 'Ofwat Proposals'

Instead of proposing to ban re-submission of capex forecasts, FE refers with approval to a supposed Ofwat scheme for restricting the re-submission of capex data. FE does not describe any such scheme in detail, so I reviewed the Ofwat document to which FE refers. (See Appendix A for relevant extracts.) In it, I found nothing that is not already part of Ofgem's process, viz:

- Initial submissions of capex forecasts;
- Discussion between the companies and the regulator's consultants; and
- Re-submission of capex forecasts in the light of these discussions, with an explanation of the reasons for any changes.

The precise text that Ofwat uses to define the process for re-submitting forecasts is as follows:

"Companies can submit representations and new evidence following draft determinations (for example, to take account of significant changes of output/scope), but we will not allow wholesale changes or rebidding."¹⁹

¹⁷ FE (2008), page 3.

¹⁸ FE (2008), page 4.

¹⁹ Ofwat (2008), page 34-35.

This text does not indicate any innovative scheme or restrictions on regulated companies re-submitting capex forecasts in the light of discussions with the regulator and its consultants. Ofwat has never applied the scheme, so the water industry does not offer any relevant experience. FE therefore appears to have nothing to contribute on this topic.

4.2. Appraisal of FE Views

Despite having (unjustifiably) cast aspersions on companies that re-submitted capex forecasts during the last distribution price control review, FE acknowledges the benefits of re-submitting capex forecasts after discussion, and does not actually have any proposals for changing the process of submitting and updating capex forecasts in the next distribution price control review.

5. Conclusions

In its paper, FE reviews two years of experience under the IQI and states some harsh criticisms of the behaviour of particular DNOs. These criticisms cannot be supported by the evidence the FE cites.

Two years is simply too little experience with which to judge whether there is over- or underspending relative to the five-year capex allowances in the IQI. There are many other possible explanations for the observed underspend and FE does not consider any of them. As a result, the analysis is partial and the conclusions are incorrect.

The IQI was set up to encourage more *accurate* forecasting of capex, not *lower* forecasts. The IQI does not offer DNOs a reward for deliberately submitting forecasts below their expected level. Equally, the IQI does not reward DNOs for deliberately over-forecasting capex with the intention of undercutting the forecast. Thus, underspending does *not* provide any evidence of deliberate over-forecasting.

To mount any criticism of DNOs' performance, FE has to make two tortuous arguments:

1. allowing DNOs to re-submit capex forecasts worked in their favour; and
2. risk aversion leads to biased and undesirable outcomes.

Neither of these arguments stands up to closer scrutiny.

In fact, FE does not even recommend that DNOs should be prevented from re-submitting capex forecast. Instead, FE refers to an Ofwat scheme, but that scheme contains nothing that is not already part of Ofgem's process.

FE's statements about risk aversion are mere assertions, not backed up by analysis. My investigation of the IQI suggested that only companies facing extreme uncertainty over future capex would shift their forecasts, and then only by one or two percentage points, in order to make use of the "cheap insurance" offered by the IQI. I can find nothing undesirable in this response to genuine uncertainty or any reason to tilt incentives in the IQI as a result. Indeed, tilting incentives in the way that FE suggests appears to be an entirely arbitrary and unnecessary response, which would raise costs to consumers.

Certain DNOs may feel that they can anticipate their position in DPCR5 and therefore favour the outcomes proposed by FE. FE's proposals may therefore attract support from some quarters. However, Ofgem should not treat such support as a basis for action. An arbitrary reallocation of rewards among DNOs offers no benefit to consumers as a whole. Ofgem should not therefore accept any of FE's recommendations until it has been demonstrated analytically that consumers have something to gain from them.

Appendix A. Ofwat Procedures

The following extracts are taken from Ofwat's March 2008 consultation document, "Setting price limits for 2010-15: Framework and approach".²⁰

Ofwat's recent proposals are really no different from Ofgem's approach to DPCR4, as indicated on the page prior to the text identified in the paper by FE. Ofwat's proposed "capex incentive scheme" (CIS) is actually a version of Ofgem's IQI, which Ofwat describes as follows:

"Under the CIS, each company recovers its actual expenditure plus or minus rewards or penalties that depend on the expenditure forecast it chooses and how actual expenditure compares to forecast. This involves us in:

- deciding a 'baseline' level of expenditure for each company;
- comparing a company's forecast to the baseline and using this to calculate an expenditure allowance for setting prices for the first five years;
- providing an incentive for further outperformance which declines as the ratio of a company's forecast to baseline increases;
- calculating ex-post rewards/penalties as the difference between the expenditure allowance and actual outturn expenditure multiplied by the incentive rate, plus an additional element structured to ensure that a company secures the greatest benefit from submitting business plan forecasts that are realistic and aligned with the expected outturn level of costs; and
- making an ex-post reconciliation between the expenditure allowance used to set prices and actual expenditure plus or minus any rewards or penalties. This amount is then carried forward for price setting for the next five-year period.

The CIS allows for symmetric treatment of capex (over- and under-spends). This means a company can choose to spend more than either the baseline we set or the capital expenditure allowance included in price limits."²¹

Ofwat then describes a three-stage process for submitting capex forecasts as follows:

"The three stages are as follows:

- The draft baseline

In December 2008, we will publish an incentive matrix and draft baseline based on the draft business plan. In addition, we will publish the outputs package on which we have set the baseline. We will publish a publicly available summary of this, as well as writing

²⁰ Ofwat (2008), "Setting price limits for 2010-15: Framework and approach", March 2008.

²¹ Ofwat (2008), page 33.

individually to each company with a short report explaining the initial judgements we have made in setting the draft baseline.

- The final baseline

We will review final business plans and allow justified changes to the baseline, either because of new information, a misunderstanding of the draft business plan or a change to the outputs package. We will publish the revised baseline at the same time as the draft determination. We will identify each company's position in the CIS by comparing its final business plan capital expenditure forecast to our baseline. This will then be an input to the draft determination.

- After draft determinations

Companies can submit representations and new evidence following draft determinations (for example, to take account of significant changes of output/scope), but we will not allow wholesale changes or rebidding.”²²

²² Ofwat (2008), page 34-35.

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