

Ofgem's consultation on frameworks for future systems and network regulation

A response from AGRF LTD

1. Who we are

This response is written by Alan Gregory and Brett Wilkinson for AGRF LTD ('AGRF').

AGRF provides advice to accounting firms and fund management companies on areas related to regulatory finance and strategy, cost of capital, risk and return, and equity portfolio construction.

Alan Gregory is a Professor Emeritus of Corporate Finance at Exeter University. He is a former CC/CMA panel member and current member of the CMA's Corporate Finance Panel. Alan's experience includes representing several UK water companies and gas networks during recent CMA appeals as an expert witness. He has also authored multiple publications, including 'Strategic Valuation of Companies' (Financial Times Management Briefing, 2001).

Brett Wilkinson specialises in providing economic support on matters of competition, regulatory finance, and strategy. He has advised corporate clients and competition authorities in the context of competition investigations and regulatory appeals, such as representing several UK water companies and gas networks during recent CMA appeals. Brett is a former investment banker with over nine years industry experience.

This response does not contain confidential information or personal data. We understand that this response will be published on the website www.ofgem.gov.uk/consultations.

2. Summary

This response considers how changes to Ofgem's regulatory framework might affect the financial environment for energy companies, their financing decisions, and the expected returns required to compensate their investors for changes to their level of risk.

Firstly, we suggest a reframing of the archetypes set out by Ofgem in its consultation. This is because there is a risk that a simple comparison of Ofgem's three archetypes, as currently proposed, may mask implicit assumptions for the method by which a project is appraised, procured or regulated within each archetype. For example, running a competitive tender to procure the building and operation of a new enterprise still requires a decision for where the form of regulation should sit on the spectrum of ex ante incentives to ex post 'pass through'. Inconsistent implicit assumptions may mean that the appraisal of each archetype is biased.

The proposed reframing asks three main questions for the relevant cost-benefit assessment for the preferred regulatory framework:

- Need – should the need for a project be assessed centrally or locally?

- Procurement mechanism – should it be built, operated or decommissioned by the licensee as a matter of course, or via competitive tender?
- Regulatory agreement – what form of regulation on the spectrum from ex post ‘pass through’ to fixed ex ante allowances should be adopted?

Secondly, we discuss key considerations for how different regulatory approaches might affect the financial environment for energy companies, financing decisions, and the risk faced by investors and their required returns, which should inform a cost-benefit assessment for the preferred framework. The discussion is purely qualitative at this stage.

Our provisional view, subject to the results of quantitative cost-benefit analyses undertaken in subsequent phases of work, is that:

- We expect that the most appropriate regulatory agreement will lie somewhere in between ex post ‘pass through’ and fixed ex ante allowances, consistent with the ex ante incentive based regulation of RIIO-2, and will be case specific. We consider that:
 - there should be clearer ex ante signalling of the allocation of risk (between investors and consumers) through clearer specification of the notional financial structure, such as the debt maturity profile, target credit and ESG rating, timing of issuance and refinancing, and hedging of interest rate and inflation risk;
 - methodological improvements should be made to the estimation of the cost of capital and setting of the allowed return, such as the introduction of cross checks from multi-factor models on CAPM-estimated returns; and
 - the introduction of a requirement for regulated networks meeting certain criteria to issue publicly tradable assets when raising finance (such as ‘traditional’ listed equity, or tokenised digital assets), could improve the availability of relevant market price data, and the accuracy of estimation. It may be interesting to explore more novel models of raising finance such as the tokenisation of regulated returns, which may democratise investment in new projects by broadening the investor base, allowing more retail investors to share in the profits of regulated networks, in turn reducing regulatory (and political) risk for companies.
- We expect that the preferred choice for the method of procurement will be case specific. It may be helpful to consider how the relative merits and demerits from different approaches to procurement may change with project characteristics, such as size and complexity, for example. This could be used to develop ‘rules of thumb’ to more easily determine whether a project should be automatically awarded to the licensee or procured by competitive tender.

3. Our understanding of the consultation and area of focus

On 10 March 2023, Ofgem followed up on its 'Open Letter on the next network price control review process'¹, in which it announced that it would be undertaking a review of the existing network regulation regime, by opening its consultation on 'frameworks for future systems and network regulation'².

We understand that the purpose of this consultation is to gather and consider views from all stakeholders with an interest in the regulation of energy networks, on whether the transformation of the energy system merits large-scale changes to price-control frameworks, methods and processes.

We welcome this comprehensive review of the design of future price controls. It is recognised that significant reform of the energy system is required if the UK is to meet its net zero targets for 2035 and 2050 to protect consumers from the effects of unmitigated climate change, and to secure its future supply of energy. With the cost of energy representing a significant component of total UK expenditure, periodic review of price controls is necessary to ensure that they are set to drive and maintain acceptable outcomes for consumers and facilitate the achievement of current stretching regulatory objectives.

Ofgem considers five areas of further investigation for its consultation: strategic planning, alternative simpler approaches to incentive regulation, maintaining a stable approach to risk and return in a period of transition, lessons learned from RIIO for designing the process for price review, and digitalisation and its role in unlocking smart regulation. In this response to the consultation, we restrict our attention to **maintaining a stable approach to risk and return in a period of transition** and discuss related **lessons learned from RIIO**.

We consider how changes to the framework might affect the financial environment for companies and their investors, their incentives, and the expected returns required to compensate them for changes to their level of risk. This is necessary to ensure that companies are able to continue to attract capital to finance their activities at the lowest overall cost to consumers. We do not consider other areas of the consultation that Ofgem has highlighted, unless relevant to the topic of focus set out above.

4. Designing future price controls

Energy networks and sources of profitability

The private companies that own and run Great Britain's gas and electricity networks operate in regions where they face little or no competitive constraints on their decision-making or price setting behaviour. It is widely recognised that firms aiming to maximise value to shareholders on a narrow basis are likely to deliver poorer outcomes for consumers versus a counterfactual in which they do face competitive constraints.

¹ Ofgem, 'Open Letter on the next network price control review process', 29 September 2022

² Ofgem, 'Consultation on frameworks for future systems and network regulation: enabling an energy system for the future', 10 March 2023 (hereafter referred to as 'Ofgem consultation')

Therefore, regulatory constraints applied by Ofgem in some form are necessary to deliver acceptable outcomes for both current and future consumers of Great Britain's energy networks, which may include driving innovation and efficiency, limiting excess profits for providers, mitigating the impact of networks on the environment, and protecting vulnerable customers.

A necessary step in Ofgem's evaluation of the regulatory constraints that should be applied to protect consumers, which are implemented through price controls, is an assessment of the total returns earned by investors in regulated network companies, and the sources of these returns.

Broadly speaking, companies subject to price controls can earn profits in one or more of the following ways:

- As a result of **allowed returns** that are expected under the regulatory settlement;
- By increasing **efficiency** of production processes;
- As a consequence of **uncertainty** of factors beyond their control, such as unexpected favourable market conditions (i.e. 'windfall gains' and losses); or
- By **acting strategically** when agreeing remuneration mechanisms with the regulator, such as by failing to reveal accurate forecasts of future costs, for example.

Ofgem should consider how its future price controls are likely to impact profit generation in each of these categories when considering how the financial framework may need to evolve.

Accordingly, we consider below some key ways in which the different approaches proposed under Ofgem's archetypes for network regulation may affect network financing decisions, incentives and related sources of profitability.

4.1. Reframing the archetypes for future network regulation

In its consultation paper, Ofgem sets out three models or archetypes for how network regulation could apply to the activities of energy network companies as part of future price control decisions. These are 'Plan and deliver' (Archetype 1), 'Ex ante incentive regulation' (Archetype 2), and 'Freedom and accountability' (Archetype 3).

To decide which approaches are most likely to allow Ofgem to achieve its objectives and discharge its duties, we agree with Ofgem that it should conduct a cost-benefit analysis against an appropriate counterfactual³, which could be a continuation of the RII0-2 approach into subsequent regulatory periods. When evaluating different approaches, it is important that they are true like-for-like alternatives in the regulatory process, without introducing confounding factors (as far as possible) that may distort results. As currently proposed, there is a risk that a simple comparison of Ofgem's three archetypes may mask implicit assumptions for the method by which a project is appraised, procured or regulated within each archetype. For example, the characterisation of Archetype 1 in the consultation assumes that cost control can be achieved by ensuring that good procurement practices are in place, relying largely on competitive tendering as a method of procurement. Whilst this may be the case, an assessment of whether Archetype 1 results in better outcomes for consumers for a particular project will depend on

³ Ofgem consultation, para. 5.1-5.5

assumptions for the form of the contract being tendered, such as the extent to which it comprises ex ante or ex post performance incentives, and the process for appraisal, such as a determination by a central system operator, for example.

In order to ensure we have a consistent basis for evaluating whether a financial framework within a price control is appropriate, we reframe the archetypes set out by Ofgem in its consultation.

For the purposes of this response, we assume that a 'project' may be split into a number of broad phases:

- *Build* - planning, design and construction of relevant assets;
- *Operate and maintain* - activities that may be classed as 'business-as-usual', which are required to keep assets operational, including repair and maintenance;
- *Decommission* - the activities that are required to take assets out of service, which may include costs of disposal.

For each phase across the range of potential projects available, the following elements should be determined:

- A **need** for the project, through an appraisal of the costs and benefits, which could be proposed and conducted by a system planner, regulatory networks, or an eligible third-party;
- A **procurement mechanism**, such as a competitive tender or regulatory award to current incumbent licensees; and
- A **regulatory agreement**, which sets the terms on which the performance of providers will be evaluated and remunerated, such as ex ante incentive regulation, cost of service regulation (i.e. cost pass-through), or some combination.

An assessment of the appropriate framework within a price control would then evaluate alternatives for each element above (i.e. a need, procurement mechanism, and regulatory agreement) for one or more stages of a particular project (i.e. build, operate and maintain, decommission) under a cost-benefit analysis against an appropriate counterfactual.

Of course, given the size of the challenge the industry faces to achieve a successful transition to net zero and to secure future supply, we understand the need for a degree of simplicity. Distinct archetypes may be the only operationally feasible method of evaluation in practice. However, it is important to remember the theoretical complexities underlying the assessment outlined above, to ensure that, as far as possible, alternatives are evaluated on a consistent basis.

In its consultation, Ofgem assumes that there will be national and regional holistic cross-vector energy system planning⁴. Therefore, in the following sections, we focus on the key considerations of different options for regulatory agreements and procurement mechanisms for potential project phases when deciding whether, and in which situations, they may be appropriate for the financial frameworks of future price controls.

⁴ Ofgem consultation, para. 1.4

5. Regulatory agreements

As defined above, a regulatory agreement with providers sets the terms on which their behaviour will be regulated, and their performance remunerated. When setting the terms for remuneration, regulators face a number of key challenges. A principal challenge is that regulators have imperfect information about companies' costs of production, and oversight of their activities and decision-making behaviour. The ways in which regulators attempt to overcome this challenge will have important consequences for returns to companies' shareholders and the sources of these returns.

Broadly speaking, the range of options for remuneration of regulated networks under a regulatory agreement sits at a point on a continuum between two extremes: 'cost of service' regulation, where companies are compensated for their actual costs incurred (including the cost of capital), on an ex post basis, and 'fixed price' regulation, where remuneration is fixed on an ex ante basis, without adjustments for differences between expected and actual costs.

We discuss below key considerations for how these polar cases may influence the financing behaviour of regulated networks and the sources of their returns.

5.1. Cost of service regulation

The compensation of regulated networks for actual costs incurred (including the cost of capital) may have desirable and undesirable effects on the sources of profitability from financial factors that drive returns to regulated networks. Key merits and demerits in relation to financial factors that should be considered by Ofgem before implementing a cost of service regulatory agreement are set out below.

Strategic action of regulated networks

Under a cost of service agreement, true operating and capital costs of networks will be revealed to Ofgem at the end of the price control period, potentially through a process of monitoring of audited statements of financial activity. As regulated networks are remunerated on the basis of their actual costs incurred, there is little or no scope for excess profits⁵ from strategic action to be earned by networks under this alternative, which helps to protect acceptable outcomes for consumers.

Efficiency of production

A cost of service agreement may have undesirable consequences for the efficiency of regulated networks. Under the assumption that an improvement in efficiency of production processes requires effort, an effective guarantee of the reimbursement of actual costs incurred by networks does not incentivise efficiency because networks do not reap the fruits of their efforts. For financing considerations in particular, this means that networks are unlikely to:

⁵ For the purposes of this response, excess profits are defined to be profits in excess of actual costs of production, including a cost of capital, without adjustment for inefficiencies

- minimise the transaction costs of financing from seeking lower debt or equity issuance costs or decreasing the frequency of issuance;
- implement a cost efficient capital structure by balancing factors that affect the cost of capital, such as tax shield benefits and the potential costs to capital providers from an insolvency scenario;
- implement a cost efficient hedging strategy by managing risk effectively and opportunistically capitalising on favourable market movements in the price of production inputs for delivery at future dates.

Additionally, a well-known form of inefficiency is the ‘gold-plating’ effect, which is highlighted by Ofgem in its consultation, whereby a difference in expected returns versus actual costs of capital can incentivise networks to over-invest in capital assets, reducing efficiency of non-financial factors of production.

Uncertainty in network costs of production

Much of the theoretical regulatory literature focuses on the asymmetry in information between regulated firms and regulators, and mechanisms for mitigating its undesirable effects. However, regulated networks rarely know their future costs of production with certainty and may face unexpected changes in trading conditions, such as cost or demand shocks, that affect profitability through factors beyond their control. This uncertainty can ultimately lead to risk for investors that will be internalised when deciding whether or not to invest in regulated networks.

Under a cost of service agreement, returns to companies are wholly, or largely guaranteed, with companies receiving remuneration for their actual costs incurred. This significantly reduces financial risk for investors, which should lower the cost of capital paid by regulated networks. This also reduces the risk of ‘windfall profits’ (or losses), where companies earn excessive (or insufficient) returns due to factors that are beyond their control. Windfall profits and severe losses requiring regulatory intervention have been seen to be unacceptable in public debate (fostering a perception of a ‘heads I win, tails you lose’ scenario).

The uncertainty in future costs and demand under a cost of service agreement is not mitigated in aggregate. Instead, it is partly or wholly transferred to consumers through the remuneration of actual costs incurred. Consumers may see their bills fluctuate excessively due to an effective pass-through of actual costs faced by networks, and an indifference to hedging strategies outlined above.

Other considerations

From an operational perspective, a cost of service agreement provides a simple and transparent remuneration mechanism that is well understood by networks. This is likely to reduce the costs of regulation for networks, and ultimately consumers.

Additionally, regulated energy networks operate in distinct regions of Great Britain.

Reimbursement of actual costs under a cost of service agreement may mean that there is regional disparity in energy prices as a result of differences in companies’ financing decisions such as preferred capital structures and hedging strategies.

5.2. Fixed-price regulation

Under fixed-price regulation, remuneration to regulated networks is fixed on an ex ante basis, without adjustments for differences between agreed and actual costs. This form of regulatory agreement may have desirable and undesirable effects on the sources of profitability from financial factors that drive returns to regulated networks. Key merits and demerits in relation to financial factors that should be considered by Ofgem before implementing a fixed-price regulatory agreement are set out below.

Strategic action of regulated networks

In contrast to the cost of service regulatory agreement, fixing network remuneration on an ex ante basis effectively makes equity holders residual claimants over profits and losses from differences between agreed and actual costs of production. Therefore, due to the imperfect information of regulators over networks' true costs of production, networks are incentivised to act strategically by claiming that their expected costs are higher than their true value. Incentivising this behaviour is likely to result in expected excess profits for those networks that are able to secure a fixed level of remuneration in excess of their true expected costs, and risks consumers facing unacceptable outcomes, contrary to Ofgem's objectives.

Efficiency of production

Despite the potential strategic action of networks, a fixed-price agreement incentivises a degree of effort from companies to improve efficiency. This is because networks reap the rewards of their improved efficiency, in contrast to a cost of service agreement. In respect of financing-related efficiencies in particular, this means that networks are likely to reduce the transaction costs of financing from seeking lower debt or equity issuance costs or decreasing the frequency of issuance, implement a cost efficient capital structure by balancing factors that affect the cost of capital, and implement a cost efficient hedging strategy.

Uncertainty in network costs of production

With networks being residual claimants over profits and losses from differences between agreed and actual costs of production, they also face profits and losses from differences between agreed and actual costs that arise from unexpected changes in trading conditions and factors beyond their control. This significantly increases financial risk for investors, which should increase the cost of capital paid by regulated networks. This also increases the likelihood of 'windfall profits' (or losses), which have been seen to be publicly unacceptable in public debate. Consumers however, may face more stable bills as a result of the fixed-price agreement effectively transferring the risk of changes to costs of production to networks.

It should be noted that whilst risk under cost of service and fixed-price agreements is transferred between consumers and networks, it is not necessarily the case that the total level of risk held by consumers and networks remains constant. Changes to the incentivisation of efficient hedging strategies under fixed-price regulation may induce companies to implement hedging strategies that mitigate the total level of risk (with residual risk being transferred to speculators for a fee as counterparties to hedging transactions).

Other considerations

Whilst a fixed-price agreement results in a simple remuneration mechanism for networks, the process of reaching a sufficiently complete agreement with an acceptable level of remuneration for networks is likely to result in material complexity for a number of parties, including Ofgem and networks themselves. This is likely to increase the costs of regulation for networks, and ultimately consumers.

Additionally, regional disparity in energy prices as a result of differences in companies' fixed-price agreements will not be due to network financing decisions such as preferred capital structures and hedging strategies.

5.3. Sliding scale regulatory agreements and other considerations

The sections above outline key considerations for two polar theoretical alternatives for regulatory agreements. In practice, it is likely that the most appropriate agreement for a particular phase of a project will lie somewhere between (i.e. a 'sliding scale' agreement), providing remuneration that is partly fixed ex ante and partly responsive ex post, which balances the costs and benefits outlined above. In this section, we discuss key features of financial frameworks that may be introduced to mitigate undesirable consequences from applying solely cost of service or fixed price agreements.

Notional financial structure

There is a wealth of publicly available current and historical financial data that is available to Ofgem for relevant securities issued by comparable networks, nationally and internationally. It has been common practice for regulators to estimate the costs of financing a hypothetical company having a capital structure that best reflects their judgement of an efficient financing strategy (a 'notional financial structure'), on the basis of this data. This is likely to significantly reduce the asymmetry of information between Ofgem and networks for the cost of financing, reducing the scope for strategic network action when compensation for the cost of financing is set ex ante.

It should be noted that the benchmarking of financing costs on the basis of publicly available financial data may only accurately represent a subset of potential financing alternatives. For example, relying solely on share price data or information on publicly available debt securities may generate an estimate that is only suitable for projects having financial profiles similar to large, established networks. Therefore, this approach may not be suitable for a fixed price agreement for small, novel, or unprecedented projects.

It is important that networks are able to implement the notional financial structure if they wish, and achieve the cost of financing that is estimated. If this is not possible, the notional benchmark may over or underestimate the true cost of financing, thereby over or undercompensating networks. For example, a particular notional financial structure may require regular issuance and continuous access to financial markets. In contrast, the financing of one-off projects may only be possible with issuance at inception, making the notional financial

structure unachievable in practice, leaving them vulnerable to a mismatch in prevailing market conditions at the time of issuance. Smaller projects may find that gaining access to required markets is not achievable at the cost of financing observed by Ofgem for larger comparable companies. In this case, adjusting a notional financial structure that is set ex ante for actual financing strategies ex post may be an acceptable approach that balances the risks of over or undercompensating companies for financing costs beyond their control.

Ex post audit of financial costs

It is probable that Ofgem will have the opportunity to assess financing costs incurred ex post. In this case, Ofgem may determine that some costs would not have been incurred by a network acting efficiently. For example, the use of derivatives (or lack of) may have increased costs unnecessarily. Under a cost of service agreement, mechanisms that are set ex ante may be introduced whereby remuneration would not be provided to networks for costs incurred inefficiently. This may encourage efficient financing strategies, mitigating certain downsides of a cost of service approach.

However, the incorporation of an ex post audit of financing costs under a cost of service agreement increases uncertainty for networks by effectively weakening the guarantee of compensation, which may increase their cost of financing. In addition, an ex post assessment may be complex to perform accurately. Where ex post assessments rely on publicly available financial information (similar to above), they may not reflect small, novel, or unprecedented projects, and may falsely indicate inefficiency, or fail to indicate inefficiency where it is present.

Contractual controls

Rather than attempting to align the incentives of networks with those of consumers and achieve Ofgem's regulatory objectives, it may be preferable to simply restrict network financing behaviour via contractual constraints. For example, regulators have historically specified credit rating thresholds that must be maintained by networks, which constrains available capital structures, or permitted distributions to shareholders only when tests of financial health have been satisfied.

However, the design of regulatory agreements that are sufficiently complete is complex, challenging, and likely to increase regulatory costs for networks. Relying solely on contractual controls to constrain strategic behaviour from companies may not be suitable for one-off projects where Ofgem has little experience or expertise.

Length of regulatory agreement

In practice, a cost of service, fixed price, or sliding scale agreement will have a specified period of time for which its terms apply. Varying the length of this period of time may affect the way in which regulatory agreements influence the behaviour of regulated networks and the sources of their returns.

Energy assets that require building, operating or decommissioning under a particular project are likely to have long useful economic lives. Regulatory agreements having shorter duration than the underlying assets means that there will be expected cashflows to networks from these

assets that are not captured by the terms of the agreement. In this case, network investors face uncertainty in the value of these cashflows that will be realised. A shorter term agreement will increase the uncertainty in the value of cashflows not captured by the agreement, which may increase the cost of financing. It will also increase the number of agreements required to cover the useful economic life of the asset, increasing regulatory costs. However, shorter term agreements provide Ofgem with the ability to amend the terms of the agreement in cases where:

- strategic network behaviour is not as expected,
- more information is revealed to Ofgem about the true costs of project financing, or
- there are significant unexpected changes in the market environment, reducing the likelihood of material windfall profits or severe losses.

Longer term agreements are likely to have the opposite effects. Therefore, an appropriate agreement length for a particular project will have to balance the costs and benefits of a number of factors, including those above.

5.4. Summary

The range of options for remuneration of regulated networks sits at a point on a continuum between two extremes: 'cost of service' regulation, and 'fixed price' regulation. We expect that the most appropriate regulatory agreement will lie somewhere in between, which is consistent with the ex ante incentive based regulation of RIIO-2, and will be case specific.

The precise point on this regulatory spectrum will balance trade-offs from the different incentives on network financing behaviour and the sources of returns, by considering factors such as:

- the incentives for networks to act strategically under fixed price agreements by claiming that their expected costs are higher than their true value, due to the imperfect information of regulators over networks' true costs of production;
- the incentives for networks to improve financing efficiency under fixed price agreements by minimising the transaction costs of financing, and from implementing a cost efficient capital structure and hedging strategy;
- the allocation of risk from networks to consumers under a cost of service agreement; and
- the extent to which trade offs can be mitigated by:
 - introducing a well-designed notional financing structure, ex post audit mechanisms, or contractual controls; and
 - varying the duration of the regulatory agreement.

6. Procurement mechanisms

The discussion above has focussed on key considerations for network financing decisions under potential options for regulatory agreements. But the regulatory agreement must be procured in some way. In this section we discuss key considerations for how a regulatory award to incumbent licensees or a competitive tender may influence the financing behaviour of companies and their potential returns.

6.1. Regulatory award to licensees

Ofgem may effectively award certain projects to incumbent networks by agreeing business plans and modifying the conditions of their licences as appropriate. In this case, without competitive pressure, Ofgem is responsible for the regulation of network remuneration.

Under regulatory agreements where compensation of the cost of financing is partially or wholly fixed ex ante, Ofgem may introduce a notional financial structure (which is outlined above). As it does for RIIO, Ofgem can set the level of remuneration according to its estimate of financing costs for a hypothetical company having a notional financial structure. Networks face the risk of differences between the allowed return and actual return.

The current approach to estimation of the cost of financing under RIIO-2 estimates the cost of equity component using a Capital Asset Pricing Model approach, the cost of debt with reference to a market benchmark (with adjustments) that represents the characteristics of hypothetical debt issued by the notional company, and incorporates a number of cross-checks, such as the ratio of market to asset values of comparable companies.

As mentioned above, misestimation of the cost of financing of the notional company can over or undercompensate networks for their expected financing costs, were they to employ the notional financing strategy. The following lessons from RIIO-2 may reduce the likelihood of misestimation of financing costs, or reduce the undesirable effects of misestimation:

- *Conditional versus unconditional expectations of financing costs:* Estimating costs of capital on an ex ante basis requires a consistent approach to the information on which the expectation is conditioned. For example, estimating costs on the assumption that current financial market information is or is not known will result in different estimates. Combining estimates calculated under inconsistent approaches is likely to result in a calculation for the cost of financing that is not reflective of expected costs under any treatment of information. For example, AGRF has made clear in submissions to the CMA during hearings for its redetermination following Ofwat's 2019 price review, that a correct approach to calculating beta under a CAPM model is to estimate the long run unconditional beta. If, instead, regulators estimate short run conditional betas (using two-year rolling averages, for example), then the effect is to introduce an additional risk into the reward to equity. In effect, short run noise is allowed to influence the allowed return. In the very long run, the short run noise may 'cancel out', but over a particular regulatory window, the effect could be important.

- *Specification of notional financing strategy:* Historically, specification of the notional financing strategy has centred around appropriate levels of gearing. Whilst this is important, it is incomplete. Ambiguity, or a lack of clarity, over other characteristics of the notional financing strategy, such as the debt maturity profile, target credit and ESG⁶ rating, timing of issuance and refinancing, and hedging of interest rate and inflation risk, can leave networks uncertain as to which approaches to financing will receive adequate compensation, and risks the improper identification of inefficient financing costs by the regulator.
- *Achievement of notional financing strategy:* In recent price controls, regulators have attempted to address the question of how the notional financing strategy should be adjusted in the face of systematic deviation of actual financing strategies by networks. As set out in the section above, it is important that notional financing strategies are achievable by networks, should they wish to implement it. Recent approaches have been adopted that adjust market benchmarks, which have been set ex ante, by applying premia or discounts to reflect average expected actual costs of financing across networks. This effectively amounts to an ex post reset of the notional financing strategy to reflect past issuance, which is not possible to achieve after the event. For example, discounts to the cost of financing may have been achieved by some networks issuing debt with a shorter maturity than the benchmark representing the notional financing strategy, potentially as a result of lower risk premia. Adjusting the cost of financing of the notional company to reflect the shorter tenor issuance is equivalent to changing the financing strategy of the notional company to include shorter-tenor issuance. However, implementing this change retrospectively makes the notional financing strategy unachievable in practice, as networks are not able to replicate by issuing debt retrospectively. In practice, complications may arise where the listed comparators available do not sufficiently represent the notional financial structure, and certain adjustments are required. For gearing in particular, estimates of the cost of equity using listed comparators typically rely on de-gearing/re-gearing methods. Where gearing of the notional company and listed comparators are sufficiently close, it may be more practical to infer a cost of capital using unadjusted estimates for the 'raw' equity beta of a proxy portfolio (at market weights), abandoning de-gearing/re-gearing methods, and relying instead on the (Modigliani-Miller consistent) assumption that the 'vanilla' WACC is invariant to gearing over the narrow range. However, this may not be suitable when innovative projects are undertaken by non-incumbent parties, where financing structures that are sufficiently close to listed comparators are not feasible or appropriate.
- *Cross-checks from multi-factor models:* It is well known that examples of portfolios exist that suggest that the CAPM is not appropriate for estimating expected returns. Since their publication, multi-factor models have been developed that attempt to resolve these issues and are now commonplace amongst valuation techniques used by practitioners and investors, particularly following the introduction of 'factor-based investing'. The use

⁶ An notional ESG rating should be specified where there is sufficient evidence that changes to ESG ratings have a material impact on the cost of financing.

of multi-factor models as a cross-check on CAPM estimates may reduce the likelihood of misestimation of expected financing costs.

- *Availability of listed comparators:* As set out above, estimation of financing costs on the basis of publicly available financial data requires instruments for companies that are sufficiently comparable to regulated networks. In recent price controls, the availability of share price data for listed UK regulated energy comparators has been scant, requiring the consideration of companies in other sectors or jurisdictions to improve accuracy. The introduction of a regulatory requirement for regulated networks meeting certain criteria to issue publicly tradable assets when raising finance (such as ‘traditional’ listed equity, or tokenised digital assets) could improve the availability of relevant market price data, and the accuracy of estimation. It may be interesting to explore more novel models of raising finance such as the tokenisation of regulated returns. Such alternative forms of raising finance could democratise the investment in new projects by broadening the investor base, allowing more retail investors to share in the profits of regulated networks and in turn reduce regulatory (and political) risk for companies.⁷
- *Post-estimation adjustments:* In addition to forming an estimate for the cost of financing, Ofgem is required to consider the level of asymmetry of returns facing investors that may require compensation, and to recognise the degree of uncertainty in its estimate by ‘aiming up’ above its central estimate for the cost of financing. This is to reduce the likelihood of adverse consequences of under-compensation of networks in a particular price control. However, ‘aiming up’ for estimate uncertainty will inherently lead to overcompensation on average as the number of price controls increases, which may be viewed as the cost of estimation uncertainty.

6.2. Competitive tender

Awarding agreements by competitive tender may allow Ofgem to harness the advantages of competitive pressure to deliver acceptable outcomes for consumers, rather than relying solely on regulation to achieve objectives.

In respect of financial frameworks for price controls, procurement by competitive tender can reduce or remove the need for Ofgem to rely on its estimate of the cost of financing. We outline below key considerations for an assessment of whether competitive tenders are an appropriate procurement mechanism for delivering an efficient cost of financing for a particular project:

- *Number of bidders acting independently:* There should be an acceptable number of bidders acting independently. A lack of competition from either a small number of bidders or bidders’ coordinated action reduces the effectiveness of competitive constraints on the behaviour of companies.

⁷ See for example, page 30 of Digital Assets: Non-Fungible Tokens: Financial services use cases and regulatory considerations and <https://www.unlock-bc.com/87026/uae-based-fasset-digital-asset-exchange-will-tokenize-solar-energy/> and <https://www.iisd.org/system/files/publications/impact-tokens.pdf>

- *Incomplete contracts and breakdown from unexpected outcomes:* The drafting of long-term agreements with sufficient completeness for certain energy-related projects is a complex exercise. Incomplete contracting may lead to strategic behaviour from winning bidders to realise greater returns (such as accepting greater financial risk to reduce hedging premia) or a greater risk of breakdown from unexpected outcomes. This may suggest that shorter term agreements are more suitable to competitive tendering.
- *Transfer of assets with long useful economic lives:* Awarding shorter-term agreements by competitive tender over assets with longer useful economic lives may exacerbate the issue of bidders excessively discounting cashflows received beyond the life of the contract to account for uncertainty, particularly in circumstances where it is expected that agreements will be retendered. This reduction in value increases the implied cost of financing. A complete contract allowing winning bidders to realise residual asset value at the end of the contract life may be required to sufficiently mitigate the impact, which may not be feasible in practice.
- *Incumbent advantages:* There may be informational advantages for incumbent networks when bidding for competitive tenders against new entrants. This is likely to undermine the competitive process, potentially resulting in excess profits for incumbents.
- *Size of pool of available capital:* The approach to estimation of financing costs discussed under the regulatory award to licensees, attempts to estimate the compensation required to remunerate a large pool of diversified investors for the systematic risk they face. Under competitive tendering, projects may form a concentrated investment amongst a small pool of bidders, for which they may require expected returns in excess of the market-wide cost of systematic risk, and therefore compensation for a higher cost of financing.

There are, of course, myriad ways in which a tender may be designed to try to mitigate some of the undesirable aspects of competitive tenders outlined above, which may or may not introduce other trade offs. Examples include 'reserve' thresholds, at which returns may be capped, the tender declared invalid, or the automatic awarding to a publicly-funded 'bidder of last resort'.

6.3. Summary

Regulatory agreements may be awarded to licensees as a matter of course, or procured via a competitive tender. The relative importance of the considerations above for an assessment of the most appropriate procurement mechanism are likely to differ depending on characteristics of the project.

It may be helpful to consider how the relative merits and demerits from different approaches to procurement may change with project characteristics, such as size and complexity, for example. This could be used to develop 'rules of thumb' to more easily determine whether a project should be automatically awarded to the licensee or procured by competitive tender.

When awarding a regulatory contract to incumbent licensees as a matter of course, the following lessons from RIIO-2 may partially mitigate the undesirable effects from the misestimation, or likelihood of misestimation, of financing costs:

- expected financing costs should be estimated using a consistent approach to the information on which the expectation is conditioned;
- there should be clearer ex ante signalling of the allocation of risk (between investors and consumers) through clearer specification of the notional financial structure, such as the debt maturity profile, target credit and ESG rating, timing of issuance and refinancing, and hedging of interest rate and inflation risk;
- the use of multi-factor models as a cross-check on CAPM estimates may increase estimation accuracy;
- the introduction of a requirement for regulated networks meeting certain criteria to issue publicly tradable assets when raising finance (such as 'traditional' listed equity, or tokenised digital assets) could improve the availability of relevant market price data, and the accuracy of estimation;
- Post estimation adjustments that 'aim up for uncertainty' may be a necessary cost of estimation uncertainty.