KPMG

Commentary on Ofgem's minded to position on the Hinkley-Seabank delivery model

Prepared for National Grid

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Contents

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1 Executive summary

In August 2017, Ofgem ("the Regulator") published a consultation on the Hinkley–Seabank project ("HSB project" or "HSB"), in which it outlined two potential delivery models as next best alternatives to a CATO regime: delivery through a Special Purpose Vehicle ("SPV model"), and under a Competition Proxy Model ("CPM").[1] Subsequently, in January 2018 Ofgem published a new consultation setting out its minded-to position that NGET should finance and deliver the HSB project under CPM.[2] Following Ofgem's publication of the minded-to position, National Grid asked KPMG to review Ofgem's consultation and comment on CPM and on the supporting analysis of the allowed rate of return under CPM by CEPA.

Rationale for CPM

CPM is defined in the earlier Ofgem consultation (August 2017) on the delivery model for HSB as a revenue allowance for NG "*in line with the outcome … [that] would have resulted from an efficient competition for construction, financing and operation of the project*".[3] This means that the primary objective of CPM, as stated by the Regulator, is to simulate the cost, risk and return outcome that would have been achieved under competitive tendering for HSB.

As set out, CPM is effectively a new regulatory framework for transmission infrastructure in the UK and marks a significant departure from the RIIO model. The Regulator's stated rationale for exploring a bespoke regime for HSB, as an alternative to the CATO model or SWW under RIIO, is to bring potential benefits of competition to customers where competition itself cannot be implemented.

Ofgem has posed a valid question whether, in the absence of competition, customers could derive benefits similar to those that could be expected under competitive tendering for HSB. The Regulator considers whether, by means of an alternative regulatory framework, additional benefits to customers could be realised in the absence of competition. This is necessarily linked to two underlying questions: (1) whether a new regime is necessary to realise such benefits and to achieve an optimal economic outcome, if it is not to introduce competition; and (2) how such a new regime should look like *in the absence of competition*.

Customers cannot benefit directly from competition in the absence of actual competition; a regulatory design is not a competitive outcome. However, this is not to say that, in principle, customers might not benefit from an updated regulatory design, especially when new market conditions or market dynamics, which could lead to such benefits, are not captured under the existing regime.

Changes to the regulatory design could objectively aim to capture key drivers that could be expected to create benefits for customers under a competitive regime, such as a low cost of debt, or reduced regulatory discretion due to longer cost allowance visibility. However, it cannot be assumed that copying some of the features of a hypothetical competitive regime, and blending these with a regulatory regime, would automatically ensure the optimal regulatory design.

The specific features of a competitive regime are generally designed to achieve an optimal economic outcome *in the presence of competition*; it cannot be assumed that the same features will achieve an optimal economic outcome *in the absence of competition*. It also

[1] Ofgem (August 2017), *Hinkley-Seabank – Consultation on Final Needs Case and potential delivery models.*
[2] Ofgem (January 2018), *Hinkley-Seabank project: minded-to consultation on delivery model.*
[3] Ofgem (August 2017), p. 8.

cannot be assumed that the HSB project would be deliverable and financeable when features of a competitive regime are imposed on the incumbent.

The overall problem with CPM is, therefore, that it is an outline of a potential regulatory framework that is neither a competitive regime, nor a fully considered and developed bottom-up optimal regulatory framework for the on-balance sheet delivery of HSB by NGET. CPM is based on an assumption that a market design from one world would constitute, by definition, an optimal design in another world, and that this solution would be deliverable and financeable.

It is not clear that in the absence of competition, the current regulatory regime could not, if appropriately re-calibrated, achieve the same or greater benefits to customers as CPM; or whether a different regulatory design for on balance sheet delivery, i.e. different than a direct copy of the features of a hypothetical competitive regime, could not achieve the same or greater benefits.

Design of CPM compared with potential alternatives

From the regulatory and economic perspectives, it does not appear that CPM satisfies a number of key economic criteria underpinning a robust regulatory design that would deliver long-term value for money for customers. The minded-to position does not provide assurance that the economic principles that underpin a robust regulatory design have been satisfied (or will be satisfied), in the case of CPM.

Specifically, it has not been demonstrated that CPM would ensure that NGET would be able to recover its efficiently incurred costs, including the cost of financing, building and operating HSB; it has also not been shown that HSB is financeable under CPM on a standalone basis, or that the cost of capital allowance is commensurate with the project risk profile.

A failure to ensure that these criteria have been met poses a serious risk that NGET would not be able to deliver and finance HSB on CPM terms without implicit cross-subsidies from other parts of the business. The latter would be economically inefficient and would be also against the essence of CPM as intended, which is to replicate a standalone competitive delivery of HSB.

Overall, CPM does not appear to have been based on a bottom-up derivation of an optimal regulatory regime from a range of possible regulatory frameworks to include features that would maximise benefits for consumers in the case of the on-balance sheet delivery of HSB by NGET. Instead, CPM simply copies key features from the existing market regimes (e.g. OFTOs), regardless of how comparable these are, and assumes that the maximum benefits to customers and economically optimal outcomes would automatically ensue, without providing rational basis for this assumption.

CPM as a reflection of a hypothetical competitive outcome

CPM is intended to mimic the equilibrium market outcome (price, cost, risk allocation), potentially achievable under competitive tendering for construction, financing and operation of HSB taken together. Under a competitive tendering, the final outcome would be driven by market forces, but CPM requires the Regulator to *hypothesise* what the efficient outcome might look like. This is difficult to achieve in practice. In the case of HSB, this problem is exacerbated because this thought exercise has to be undertaken in the absence of any precedents, as there have been no competitively procured projects of similar nature, with the same technology, or regulatory risk as HSB. There have been also no other similar-sized transmission projects with construction risk in the GB market delivered this way, and, in fact, no competitively tendered standalone projects in onshore networks at all.

It would be difficult for anyone under this setup to establish a robust view of what a hypothetical competitive outcome could look like. This poses the risk that, if the parameters of CPM are estimated poorly, either due to deficiencies in analysis, or due to lack of sufficient information, the outcome might not be deliverable in practice.

Value for money (VfM) for customers analysis supporting CPM

In order to justify a new regulatory framework intended to capture potential additional material benefits to customers without increasing costs, it is important to estimate the likely VfM that could be realised under the new regime compared with best possible alternatives. However, the VfM assessment of CPM, as presented in the minded-to consultation, is limited in scope and does not assess optimal model design options that could increase or reduce efficiency savings and long-term value for consumers.

For example, there is no evidence or analysis to show that, compared with potential alternatives, CPM would ensure that tariffs are profiled (and therefore costs are recovered) in a way that achieves the optimal trade-off for consumers between frontloading the costs over a period shorter than the economic life of the project and ensuring that it is financeable.

Furthermore, the assessment is generally limited in terms of key model design features that are considered and assessed for their ability to deliver efficiency savings, and also in terms of the number and specification of best possible alternatives (counterfactuals). Instead, the VfM focuses on reflecting what are, in effect, pre-assumed savings from financing under CPM compared with only one, stylised counterfactual.

Specificity and details of CPM

The level of detail in the current specification of CPM does not allow for the project to be priced with a high degree of confidence. The regulatory design underpinning CPM does not contain detailed specification of key features that would define the residual risk a hypothetical investor would be exposed to. Some of the key features that remain not fully specified include Capex cost sharing factors, definition of ‘controllable’ vs ‘uncontrollable’ expenses, Opex risk mitigants, availability targets, or the treatment of refinancing.

Consequently, any attempt to price required returns under CPM at present would need to address a wide range of potential risk allocation outcomes and would be subject to wide confidence intervals and significant risk premia. Without further specification, it is unlikely any potential bidder would in fact consider the project in the first place. The minded-to consultation and the associated cost of capital estimates do not appear to acknowledge this uncertainty, or link the plausible range of potential acceptable risk allocations with the derived estimates of required returns.

The lack of specification of CPM means that CEPA has been given an impossible task by being asked to develop a market price for a project that is not specified. For that reason alone, CEPA’s results are open to challenge.

CPM as a proxy for standalone project finance

To the extent the proposed high-level design of the regime for the project has been specified, it is inconsistent with typical project finance structures. This risks the final specification and risk allocation outcome not being appropriately priced.

On risk allocation, CPM departs from a typical project finance model in that construction risk is not fully specified in terms of the scope of the post-construction review and the risk-sharing rate; the availability targets and levels of penalties have not been set so that availability risks cannot be assessed at present. Additionally, the counterparty risk under CPM is also higher than for a typical PFI project because NGET is not a government entity and the additional regulatory risks exist in that there is scope for regulatory discretion around e.g. additional and maintenance Capex and final Opex allowance.

The return calculation under CPM departs from how the project rate of return would have been determined by potential bidders because the separate treatment of construction and operational periods is not aligned with the market practice of considering both phases jointly to maximise value. The assumed two-stage debt financing is not aligned with the market practice of arranging debt upfront to avoid refinancing risks; gearing is assumed fixed when it would in fact vary over the contract tenor; and neither financial covenants nor their costs are

considered. Assuming different ratings for each phase of the project is also not aligned with a standard rating methodology of assigning one rating over the contract tenor and the financial structure has not been optimised as it would be in the standalone project finance setting.

In principle, CPM could potentially be specified such that the project is financeable under a project finance competitive outcome. This would require a return allowance that appropriately remunerates the cashflow risk of the project consistent with such an outcome. However, this would not be consistent with the proposed methodology given all the differences and gaps in structuring and risk allocation as listed above and it cannot be assumed this would be the optimal deliver model to deliver maximum benefits.

Estimation of the required returns on HSB under CPM

Even if the project could be effectively priced (i.e. if the model were to be ultimately correctly specified in full, including adequate definition of risk allocation and other key characteristics), the proposed methodology used for estimating the cost of capital has deficiencies which imply that the allowed return derived under this methodology would not be robust.

When estimating the required rate of return for HSB under CPM, Ofgem's consultants do not sufficiently consider potential market responses to putting HSB out for competition—e.g. how investors would approach financing, what financial structures would be developed in practice, how markets could react to the proposed regime, how the proposed risk allocation would be priced, or what would be the impact of specific project parameters on structuring and financing. All these factors could significantly impact the resulting rates of return and need to be analysed and taken into account.

Instead, the project hurdle rates are estimated by combining two WACCs; one of which is a CAPM-based WACC estimate for the construction period, while the proposed operational phase WACC is based on competitive benchmarks from OFTOs. The latter has been used despite the fact that no clear link can be established between the risk allocation achieved in the OFTO models and the risk allocation (that could be) embedded in the CPM framework.

More generally, the OFTO benchmarks are poor comparators for HSB because they are not sufficiently comparable to assume the same rate of return, even for one phase of the project: OFTOs are multiple, smaller, simpler, mature, competitively tendered projects based on a regulatory regime whose deliverability has been tested in practice over several rounds of tendering. In contrast, HSB, as proposed, is unique, large, complex, new, 'first of a kind' (from a technical, market and regulatory perspectives), not competitively tendered, and based on a proposed regulatory regime, which is not fully specified.

Notwithstanding different risk characteristics of OFTOs and HSB, the analysis in the consultation also ignores the value placed by OFTOs' bidders on elements of the regime such as assumptions around tax outperformance and terminal value. In addition, some CPM features, where specified, already imply greater risk for HSB relative to OFTOs, e.g. longer operational period and no defined pass-through costs.

Bidders for OFTOs compete for 'ready-made', operational, brownfield assets. In contrast, potential bidders for HSB would be asked to bid for a new, greenfield project and would have to deliver and take on the risks of both construction and operational phases (i.e. they could not bid e.g. for the operational phase only). This is likely to attract different types of bidders, with different market appetites, who would rely on different types of financing. Splitting the project into 2 phases is a conceptual exercise rather than a reflection of what investors would bid for up front.

In order to estimate target returns required for HSB in practice, weight would need to be given to market observations for projects with similar risk profiles, including construction risk and financing structures. There is considerable evidence on the returns from PFI projects which could inform such analysis, but this has not been taken into account.

Observed bid WACCs for competitively tendered assets need to be viewed holistically in conjunction with the investors' assessment of the project risks and opportunities to maximise revenue streams and expected returns.

The analysis of the rates of return by Ofgem's consultants for the construction phase focuses on market parameters under CAPM rather than on the details of financing that would actually result in the market and that would drive required returns. For example, the estimated construction WACC is based on a CAPM approach. CAPM can be applied in a way that is consistent with a competitive outcome, but the current application does not ensure that this is the case.

Specifically, the beta is not based on a relevant set of comparators whose risk profile matches that of the project. Also, no consideration has been made for including appropriate premia for asymmetric risks, which are typically applied in project finance to reflect the return requirements of construction projects with substantial downside risks where these risks have not been taken into account in probability-adjusted projected cash flows (as also required for the application of CAPM). While CAPM can inform the assessment of a lifetime project WACC, it would need to be supplemented to reflect asymmetric downside risks of a single project where assumed allowances (projected cash flows) are not adjusted for such risks. Given the above, it is unlikely that the estimated construction WACC would be consistent with a competitive outcome.

The returns analysis also makes no meaningful attempt to link the application of the chosen approach to the actual features of CPM as specified, as would be necessary to derive required returns under a competitive model. This means the analysis of the likely outturn rate of return on HSB under CPM, as considered by the Regulator, is not robustly determined.

2 Introduction

2.1 Context

Under the current RIIO T1 price control, the delivery of large and uncertain projects is carried out under the Strategic Wider Works (SWW) mechanism. Under the SWW process, an allowance for the pre-construction funding of qualifying projects is included in the main RIIO T1 allowance, but TOs are then required to seek separate funding allowance from Ofgem within the regulatory period, once the need for and cost of such projects becomes more certain. Ofgem had announced as part of the RIIO T1 settlement that projects that fall under the SWW mechanism could be subject to competition in the future.

In the period 2013–2015, Ofgem undertook the *Integrated Transmission Planning Regulation (ITPR)* project, where it concluded, amongst other, that the role of competition in transmission should be increased, if it could bring value for consumers.

Ofgem's impact assessment forming part of the ITPR project, found that introducing competition could potentially deliver benefit for consumers through downward pressure on capital, operating and financing costs as well as through driving innovation; however, the impact assessment equally highlighted additional costs associated with competitive tendering, including costs incurred by Ofgem to set up the system, costs incurred by bidders when preparing bids, as well as additional interface costs, associated with managing the interface between the standalone assets and the rest of the transmission network.[4]

Stakeholders have generally recognized that different projects may have a different balance of costs and benefits that could be realized through competition, subject to e.g. technical characteristics, interfacing needs between the asset and the existing network and other factors.

Subsequently, in early 2015, Ofgem initiated the *Extending Competition in Transmission (ECIT)* project intended to introduce competition in the delivery of *large, separable, and high value,* onshore electricity transmission projects, where the latter were deemed to have the greatest potential of realizing benefits for customers in excess of the administrative and interface costs associated with the introduction of competition.[5]

In June 2017, Ofgem published an *Update on Extending Competition in Transmission,* in which it set out its plan to postpone the introduction and development of *Competitively Appointed Transmission Owner* (CATO) regime*,* given the postponement of enabling legislation needed for the introduction of CATOs, as a result of Brexit. Ofgem's subsequent rapid advancement of alternatives to the CATO framework, as discussed below, has to be viewed in this context, as motivated by legislative hurdles preventing it from introducing CATOs as the first best alternative to introducing competition in onshore transmission.

[4] Ofgem (March 2015), Integrated Transmission Planning and Regulation (ITPR) project: final conclusions – Impact assessment, supporting document, accessed here: https://www.ofgem.gov.uk/sites/default/files/docs/2015/03/itpr_final_conclusions_impact_assessment_publication_final.pdf

[5] See Ofgem (2015), Integrated Transmission Planning and Regulation (ITPR) project: final conclusions, decision statement. Accessed here: https://www.ofgem.gov.uk/sites/default/files/docs/2015/03/itpr_final_conclusions_decision_statement_publication_final.pdf

In August 2017, Ofgem published a consultation on the Hinkley–Seabank project (henceforth "HSB project" or "HSB"), in which it outlined two potential delivery models for HSB as next best alternatives to a CATO regime: delivery through a Special Purpose Vehicle (henceforth "SPV model") or through a Competition Proxy model (henceforth "CPM").[3] Ofgem had been consulting on the introduction of competitive tendering under the CATO regime since 2013 (see above), but has only recently developed the alternative SPV and CPM models.

In January 2018, having reviewed the responses to its August 2017 consultation, Ofgem published a subsequent consultation which set out its minded-to position on the delivery model for HSB (henceforth "the minded-to consultation"). The minded-to consultation set out the view that National Grid Electricity Transmission should fund the HSB project via the CPM route.[4]

2.2 Scope

This report has been prepared in the context of Ofgem's minded-to consultation on the delivery model for HSB, published in January 2018.

The minded-to consultation sets out Ofgem's position to allow a separate revenue allowance for NGET for delivery of the HSB project via the CPM mechanism, which is intended to reflect the outcome that would be achievable under competitive tendering for construction, financing and operation of HSB.

Chapter 3 of the minded-to consultation sets out Ofgem's motivation behind choosing CPM as the delivery model for HSB, including (1) a proposed range for the Cost of Capital allowance for HSB, based on a study by CEPA (Ofgem's Consultants), and (2) a relatively undetailed Value for Money assessment of the proposed CPM model (and the SPV alternative) against the RIIO SWW counterfactual.

Separately, Chapter 4 of the minded-to consultation sets out an outline of a selected set of features of the potential regulatory model that would underpin the delivery of HSB under CPM.

Against the above background, in February 2018, National Grid asked KPMG to review Ofgem's minded-to position, as well as CEPA's methodology used to set out a range for the proposed Cost of Capital under CPM.

This report is based on a detailed review of the following documents:

- Ofgem (August 2017), Hinkley-Seabank – Consultation on Final Needs Case and potential delivery models.
- Ofgem (January 2018), Hinkley-Seabank project: minded-to consultation on delivery model.
- CEPA (January 2018), Review of Cost of Capital ranges for new assets for Ofgem's networks division.

This report sets out commentary and observations on the documents above, specifically structured around the following areas:

- First, the report discusses the design of the regulatory framework underpinning CPM, including:

  - The extent to which CPM can robustly mimic a competitive outcome given that it assumes on balance sheet delivery by NGET and relies on a regulatory view of what constitutes an efficient competitive outcome in terms of costs, risk allocation and price; as well as the process used to arrive at the regulatory framework underpinning CPM;
  - The extent to which it has been ensured that the framework for CPM has been derived to provide an optimal regulatory model for on balance sheet delivery of HSB by NG and is consistent with a robust regulatory design, based on a set of economic criteria for such design; and
  - The extent to which the Value for Money (VfM) for consumers assessment informs that CPM provides maximum benefits for customers.
- Second, the report discusses the level of specification of the regulatory framework underpinning CPM, including the extent to which it is consistent with a typical project finance structure that would be expected for a project like HSB, which would have been the likely delivery route if HSB were to be competitively tendered; and
- Third, the report discusses the proposed methodology for setting the Cost of Capital allowance for HSB, in light of the current level of specification of CPM.

This report does not consider or propose alternative delivery models for HSB, nor does it consider alternative cost of capital estimates for HSB under CPM or under any other regulatory framework.

2.3 Structure of the report

The structure of this Report includes the following:

- Section 3 sets out the key features of the proposed Competition Proxy Model (CPM);
- Section 4 comments on the design of the regulatory mechanism underpinning CPM;
- Section 5 comments on the proposed CPM specification;
- Section 6 discusses the proposed methodology for calculating the proposed Construction and Operation WACCs for HSB; and
- Section 7 presents concluding remarks.

3 Key features of the proposed Competition Proxy Model (CPM)

This chapter briefly discusses the features of the HSB project and stated rationale for introducing CPM as well as the key features of the regulatory framework underpinning CPM, as proposed in the minded-to consultation.

3.1 Key characteristics of the HSB project

The HSB project entails building an onshore electricity transmission connection to connect the planned Hinkley Point C (HPC) nuclear plant in Somerset to National Grid's existing transmission network. HPC will comprise of two reactors, each with 1.67GW capacity. NGET's proposed technical solution for connecting HPC to the transmission grid is to build a new circuit route between the existing Hinkley Point and Seabank substations.

The construction period of HSB is intended to last over a period of 5 years, and NGET is scheduled to connect the first HPC nuclear reactor in 2024, ahead of EDF's expected commencement of operations of HPC in 2025.

The cost of the project is currently estimated at £800m.[6] This makes the HSB project substantially larger in size compared to, for example, all of the OFTOs tendered to date, but comparable in size to some of the Private Finance Initiative in the UK, such as for example the construction of the M25 motorway (£982m) or the new Queen Elizabeth Hospital Birmingham (£774m).

The HSB transmission connection is an asset with a long useful economic life, expected to be operational for c45 years once built. Therefore, the economic benefits of the project will extend significantly beyond the typical concession period for a standalone project, and, specifically, beyond the 25-year operational period over which capital costs are intended to be recovered under CPM.

The HSB project has been granted a Development Consent Order (DCO) and has been progressed through the planning stage, with construction expected to commence in early 2019. Commencement of construction on schedule is important, to the extent that it affects the delivery of electricity by Hinkley Point C to consumers in the GB market.

In particular, a delay of the HSB project could have wider economic repercussions in the GB energy market, including, but not limited to: (1) impact on the wholesale electricity price in the UK market from HPC not bidding into the wholesale market, (2) implications for HPC investors whose CFD contracts are contingent on HPC delivering electricity to the grid, and (3) possibly wider implications on confidence in the UK regulatory regime and its ability to enable the timely delivery of large-scale, Capex heavy projects.

The use of T-Pylons over conventional lattice pylons has been one of the key considerations for the HSB project, which affects costs and risk. The general characteristics of the HSB project mean that costs for each of these designs options are significantly higher relative to

[6] Hinkley - Seabank: Minded-to consultation on delivery model – p. 6

generic benchmarks,[7] as a result of e.g. poor ground conditions.[8] The report by Ofgem's technical consultants (TNEI) also notes that T-Pylons is a new design.[9]

Appraisal of the Final Needs Case primarily assessed the technical and economic worth of HSB. The FNC found that the project is in consumers' interest, based on the cost-benefit analysis and given the risk that HPC would not be able to safely connect to the grid without HSB.[10] However, Ofgem has not agreed that the additional costs of T-Pylons are justified and that extreme weather risk should be funded in full up-front cost.[11] The parties are in continued discussions over best treatment of extreme weather risks.[12]

For all of the reasons above, HSB is a strategic asset whose timely delivery is likely to have broad economic impact on customer and investor confidence in the UK infrastructure market; and separately, HSB is an asset with significant risk exposure given new technical design in addition to a new proposed regulatory framework for its delivery, discussed further below.

3.2 Stated rationale for introducing CPM

The minded-to consultation proposes that National Grid finances investment in a transmission connection for Hinkley Point C under a Competition Proxy Model (CPM).

The CPM is defined in the earlier (August 2017) consultation on the delivery model for HSB as a revenue allowance for NG "in line with the outcome … [that] would have resulted from an efficient competition for construction, financing and operation of the project", i.e. the outcome of competitive tendering for ownership of the project.[13] This means that the primary objective of CPM, as stated by the Regulator, is to simulate the cost, risk and return outcome that would have been achieved under competitive tendering of the project.

The motivation behind the minded-to position appears to be the view that competitively tendered delivery models, e.g. such as OFTOs and others, are evidence that there are savings to be achieved mainly in the area of financing costs and, to a lesser extent, in cost efficiencies.

The CPM is, in Ofgem's view, the Regulator's next best alternative to introducing elements of competition in electricity transmission, having established that legal hurdles and limited time prevent it from imposing the alternative competitive frameworks (CATOs and SPV Models) for the HSB project, which it had been originally minded to employ (see section 2.1 for details).

The minded-to consultation states that the introduction of competition in electricity transmission would benefit customers for the following reasons, all related to the cost of financing the project:[14]

[7] Final Needs Case Assessment: Hinkley Seabank Strategic Wider Works – p. 41
[8] Final Needs Case Assessment: Hinkley Seabank Strategic Wider Works – p. 43
[9] Final Needs Case Assessment: Hinkley Seabank Strategic Wider Works – p. 45
[10] Decision on Needs Case for the Hinkley – Seabank Project – p. 2
[11] Decision on Needs Case for the Hinkley – Seabank Project – p. 1
[12] Decision on Needs Case for the Hinkley – Seabank Project – p. 2
[13] Ofgem (August 2017), p. 8.
[14] Ofgem (January 2018), para 3.17, p. 18 -19.

- The competitive models will reflect and lock in historically low cost of debt financing, benefiting customers for the length of the project;
- The competitive models will ensure that operational WACC appropriately reflects the low rates of return determined through competition (OFTOs); and
- The competitive models will ensure efficient level of gearing, during construction and operation of the assets.

Separately, a Value for Money to consumers assessment presented in the minded-to consultation concludes that CPM can deliver benefits to consumers, where the calculations consider benefits of CPM and SPV relative to the existing RIIO (SWW) mode of delivery. At the same time, the consultation provides little information on the approach taken to consider the value for money assessment under CPM. The key feature of the impact assessment is that it is intended to consider the merits of the two alternative models entertained by the Regulator (SPV and CPM) to the status quo under RIIO, under which the project would have been delivered through the SWW mechanism (see section 2 for background).

The impact assessment is based on comparing NPV of allowed revenues under the SWW approach to NPV of revenues under the two alternative models net of additional costs, and appears to primarily consider the following three features of the two alternative models, namely:

- Lower cost of capital relative to the allowed rate of return under SWW, as proposed by CEPA (Ofgem's consultants);
- Lower Capex and Opex relative to the allowed Totex under SWW, with assumed cost efficiencies of 5% under CPM; and
- Shorter cost recovery period.

The consultation sets out that an adjusted RIIO price control financial model was used to project revenue profiles under the RIIO SWW framework, assuming an allowed cost of capital fixed over the full 45-year period. A 'project finance model' was used to project revenues under CPM. However, the assumptions used in the project finance model, other than the cost of capital and the concession period, have not been disclosed.

This report provides commentary and initial observations on the above in sections 4 to 5 below.

3.3 Discussion of the key features of the proposed CPM framework

The proposed CPM framework, as broadly set out in Chapter 4 of the minded-to consultation and associated appendices, is a substitute for the existing RIIO T1 (SWW) regulatory framework for delivery of HSB.

CPM is intended, by design, to proxy the outcome of a competition model rather than to develop a new regulatory model bottom-up from a range of alternatives for on balance sheet delivery by NG; it is effectively a substitute for an existing regulatory model, not a competition model.

CPM relies on a regulatory view of what the efficient cost, optimal risk allocation and return / financing cost outcome would look like for a project like HSB, even though its deliverability

and feasibility have not been previously tested, and existing benchmarks (e.g. OFTOs) offer very limited comparability given key differences in scope and technology as well as project regulatory risks (as proposed under CPM).

In its current form, as outlined in Chapter 4 of the minded-to consultation, CPM is an outline of selected features of a potential regulatory model, characterised by several key elements:

- A fixed, 25-year revenue stream for operation of the project, with no periodic reviews, and with some revenue (CoD on annual Capex) received during the construction period;
- Full depreciation of Capex over a 25-year operating period, at the end of which the assets would be added to NGET's RAB at a residual value of zero, a provision which is intended to shield NGET from asset stranding risk;
- A revenue stream received during the operating life of the asset, indexed to an unspecified inflation index;
- NGET faces Capex risk on 'controllable' Capex, subject to unspecified sharing factor; NGET will be allowed to pass through some cost risk on what Ofgem considers 'uncontrollable' cost base;
- NGET faces Opex risk during the operating period, up to an unspecified materiality threshold which will trigger a force majeure event;
- A mechanism for HSB to make additional investment into their assets during the revenue term to respond to new network needs, but based on unspecified regulatory framework (defined as 'the prevailing framework' at the time when maintenance Capex is needed); and
- HSB is subject to the prevailing RIIO incentives (e.g. Energy Not Supplied etc).

The CPM is not a bottom-up development of a regulatory framework, but rather it is designed and intended to mimic features of an unknown outcome of a potential yet untested competitive process. In practice, this means that CPM's emerging regulatory design is based on borrowed features from other regulatory regimes (OFTOs and RIIO T1, see the next section for details).

CPM is intended to proxy a competitive outcome in on shore network regulation, although the latter does not feature in UK network regulation.

The regulatory mechanism underpinning CPM does not appear to have been designed based on considerations around a design that would deliver the greatest value for money for consumers derived bottom-up from a wide range of alternatives, but rather it was designed by borrowing features from existing regulatory frameworks (e.g. OFTOs) and hypothesising about what a competitive outcome could look like, *under the assumption* that those assumed features would offer best value for money for consumers in case of the on balance sheet delivery of HSB by NG.

CPM also covers only some aspects of a regulatory treatment of new investments, leaving a number of important areas unspecified, with material gaps in the specification of e.g. incentive rates on cost and outputs, which are key features that would define risk exposure under incentive regulation, the treatment of new Capex requirements etc.

HSB would be the first project to be delivered under the proposed CPM framework. This means that the deliverability of projects under CPM has not been tested to date, and that the

Regulator cannot rely on cost benchmarks (Capex or financing) with the specific regulatory (or technical) characteristics as HSB, when setting its regulatory allowance.

CPM is a significant departure from the existing RIIO regime. It contains a proposed skeleton of a regulatory framework intended to specify a revenue allowance for the duration of the life of the project, albeit one that does not specify a detailed risk allocation to (potential) investors (NGET) vs consumers in its present form.

CPM also contains a regulatory allowed return as part of this framework, which is intended to reflect the competitive rate at which an independent project developer would finance the project.

This report comments on the proposed CPM framework in section 4 and 5 below, and on the proposed return allowance in section 6 below.

4 Commentary on the design of the regulatory framework underpinning CPM

This section discusses the design of the regulatory framework underpinning CPM, including:

- The extent to which it is able to mimic a competitive outcome given it rests on regulatory view of what constitutes an efficient competitive outcome in terms of costs, risk allocation and price, as well as the process used to arrive at the regulatory framework underpinning CPM, discussed in section 4.1;
- The extent to which it has been ensured that the framework is consistent with good regulatory design, based on the economic criteria that underpin good regulatory design, discussed in section 4.2; and
- The extent to which the Value for Money assessment informs whether CPM provides benefits for consumers, discussed in section 4.3.

4.1 CPM as a regulatory framework that proxies a competitive outcome

The proposed CPM framework is a significant departure from the existing RIIO framework applicable for NGET. The RIIO T1 price control had envisaged that delivery of projects like HSB would be carried out under the Strategic Wider Works mechanism, through which the appraisal and delivery of large and uncertain projects was intended to be managed within RIIO (see section 2.1 for background).

CPM is intended to proxy a competitive outcome whereby the terms of delivery of HSB are competitively tendered to interested bidders. However, in practice, CPM is neither a competitive outcome, nor a regulatory model derived and specified from first principles, in order to replace the existing RIIO framework for delivery by NGET for several reasons. This is a significant limitation of Ofgem's approach.

The equilibrium price, cost and risk allocation in a competitive outcome is driven by market forces, whereas CPM requires that an external party, in this case the Regulator, takes a view and decides what that competitive outcome could look like. For this reason, CPM does not reflect a competitive outcome, but rather the regulatory view of what the competitive outcome might look like.

Given that there have been no competitively procured projects with the same technology and regulatory risk as HSB under the proposed CPM (nor other similar-sized transmission projects with construction risk in the GB market), it would be difficult for any party, including the Regulator, to establish a robust view on what the efficient outcome, including on capital and operating expenditure (and associated expected efficiency savings), financing costs as well as optimal risk allocation would look like under a competitive outcome.

At best, all of these key features that define project deliverability and feasibility would have to be estimated with an associated (and likely wide) range of uncertainty. At worst, they could be estimated poorly such that the outcome might not be deliverable neither by a third party,

nor by NGET on balance sheet, as currently envisaged, without cross-subsidies from NG's other business activities, which is not economically efficient.

At the same time, CPM is not a bottom-up derived new regulatory model from a range of potential alternatives since it pre-assumes that the optimal regulatory design is to hypothesise what the competitive outcome could be and mimic it in a regulatory framework for NGET on balance sheet delivery. It appears that CPM is not based on a bottom-up assessment of optimal regulatory design to develop features that would optimise benefits for consumers in the case of HSB being delivered by NG on balance sheet.

In order to achieve the equivalent of a competitively tendered outcome, the minded-to position appears to be that CPM can borrow or copy features from the existing regulatory frameworks observed in those contestable markets. However, this position appears to have been reached without a detailed appraisal of whether the regulatory features observed in those contestable markets would, in fact, lead to optimal outcomes for NGET and customers in the case of on balance sheet delivery of HSB by NG.

To the extent that the high level features of CPM have been defined, they have been borrowed from existing regulatory frameworks applied in different settings. For example, from the OFTO regime, CPM borrows features such as: (1) a similar concession period over which a levelised, annual cost allowance is calculated (including 'depreciation' and an Opex component), (2) similar arrangement to bear Opex risk over the entire operating period of the asset, and others. At the same time, from the RIIO T1 regime, CPM borrows features on output incentives, and possibly cost sharing incentives, with envisaged, but currently unspecified, adjustments to the RIIO T1 factors.

All of these features define the risk and incentives under the regulatory framework, and its ability to deliver efficiency savings and (long-term) benefits for consumers. None of these features have been designed based on a bottom up assessment of what would be an optimal solution for HSB for on balance sheet delivery by HSB from a range of potential options that would deliver long-term value for money for consumers, without a priori expectation of what those key features should look like based on features seen in other markets.

In summary, CPM as proposed does not set out a fully specified competitive model with evidence of its deliverability in a real (project finance) setting, nor does it set out a fully considered, and bottom-up developed regulatory model, designed with a view to achieve maximum, long-term value for money for customers if delivered by NG on balance sheet.

4.2 The economic criteria for regulatory framework design

Notwithstanding how CPM was derived, this section discusses to what extent CPM ensures that the model, as proposed, satisfies key economic criteria that would be expected from a robust regulatory design of a new regulatory framework for a critical asset.

Based on the economics of irreversible, long-term investments with large fixed costs, the economic criteria that underpin durable regulatory regimes and provide long-term benefits for customers include the following:

4.2.1 The model allows a reasonable prospect of efficient cost recovery (moves towards allocative efficiency)

The first economic criterion against which a regulatory regime has to be appraised is its ability to ensure recovery of efficiently and prudently incurred costs for delivering the regulated good or service, *including an appropriate allowance for the cost of capital,* set at a level that is sufficient to attract equity and debt capital.[15]

To satisfy this criterion, an appropriate regulatory development of a new model would have been to consider whether certain conditions have been met, which together ensure that the investment proposition of the regulatory regime is viable and deliverable in practice—these include the considerations discussed below.

4.2.1.1 The cost allowance (excluding financing) is reasonable and achievable by an efficient firm

In a competitive market, investors take a view on costs, revenues, and profits, as well as the risk around those central profit forecasts. Investment decisions are then taken based on an assessment of whether the expected return of the project is sufficient to cover the (non-diversifiable) risks around the project cashflows.

In a regulatory setting, it is the Regulator that ultimately takes a view on the efficient costs of the project. Therefore, it is important that the Regulator ensures that the cost allowance is achievable, and that any risk around cost recovery that remains with investors (e.g. as a result of incentives for cost minimization) is appropriately priced.

To do this, the cost allowance has to be viewed holistically and in conjunction with the return that will be allowed for the project, in order to ensure that: (1) all project costs and implementation costs under the proposed regulatory framework are reflected in final tariffs, (2) all necessary risk buffers are included in the cost allowance, and (3) the proposed return of the project reflects the remaining residual project risk, not priced via risk buffers in the cost allowance.

The minded-to consultation does not appear to take this holistic approach nor does it consider the interdependence between the different cost components, which risks that all costs will not be appropriately reflected in the allowance, and that therefore the model will not be deliverable in practice.

4.2.1.2 The project is financeable on a standalone basis

The regulatory regime for a single, specific project, has to ensure that this project can attract capital on reasonable terms on stand-alone basis, and is consistent with the cost of capital allowance for this project for which the specific regulatory framework has been derived.

In UK regulation, this criterion has been typically interpreted as achieving a ‘comfortable’ investment grade rating (above BBB) consistent with the CoD allowance, with companies’

[15] The starting objective of natural monopoly regulation is to align prices with the true cost of provision of the monopoly good or service, thereby restricting monopoly profit to competitive levels. This increases allocative efficiency in the economy, because prices that reflect the true economic cost of production encourage efficient consumption choices, thereby leading to more efficient allocation of resources in the economy to where resources are valued most.

ability to achieve target credit metrics being typically stress-tested to ensure resilience around this target.

It cannot be assumed *a prori* that the project will be financeable on a stand- alone basis, at comfortable investment grade rating, under the proposed CPM specification, given e.g. the lack of risk allocation.

The minded-to consultation does not stipulate whether financeability will be checked and ensured on a stand-alone basis, or at a company/licensee level (NGET). Ensuring financeability on a standalone basis is important for the following reasons:

- CPM is an outline of a regulatory mechanism applicable to one particular project; the financeability check needs to be consistent with the scope of regulation, i.e. the HSB project in this case.
- The HSB project is a large, Capex-heavy project proposed to be delivered under CPM, effectively a new and bespoke regulatory framework with (implied but not fully specified) different risk allocation from the existing RIIO framework. Therefore, as a matter of check of internal consistency, it is necessary to check and ensure financeability on a standalone basis, thus satisfying the requirement that the allowed cost of (debt) capital is commensurate with the risk under CPM, and consistent with the assumed credit rating in the WACC allowance.
- If the regulatory objective is to mimic a competitively tendered outcome (notwithstanding the fact that this might not ensure maximum benefits to customers), then, by definition, the objective would be achieved *if and only if* it is ensured that the HSB is financeable under CPM on a standalone basis, and therefore can be delivered by a third-party without a cross subsidy from NG's other activities.
- Finally, financeability on a standalone basis should be ensured to avoid that one part of the NGET business cross-subsidises another (HSB), an outcome which would be economically inefficient.

  Moody's recent credit opinion suggests that NG would lose headroom on financial ratios if HSB were delivered on the proposed terms,[16] which means that NGET would lose the ability to withstand shocks without breaching credit metrics if HSB were delivered under the proposed terms. To remedy this, therefore, NGET may need to be offered an offsetting positive impact on credit metrics elsewhere in the RIIO settlement.

For all of the reasons above, financeability should be tested on a standalone basis for this project under the full regulatory model to be developed for this project. It is not evident that Ofgem has undertaken such an assessment or, if it has, on what basis it has reached a positive conclusion on this question.

4.2.1.3 The cost of capital allowance is set at a level that is commensurate with the risk profile of the project, and that therefore ensures the project can attract sufficient debt and equity capital

This criterion requires that the regulatory framework has a clearly defined risk allocation, and a return allowance that is consistent with that risk allocation, as well as that all relevant risks are fully priced. Ensuring that this criterion is satisfied is important, as failure to do so may imply that the regulatory regime has not provided an overall investment proposition that

[16] Moody's Investor services, 29 January 2018. Sector Comment: Britain's electricity Regulator proposes framework that sharply lowers returns for new transmission projects.

would attract sufficient debt and equity capital to finance the endeavour, ultimately to the detriment of customers.

In the case of HSB, the proposed CPM does not have a clear risk allocation between the key stakeholders—investors and consumers—and therefore any return allowance estimate would have wide confidence intervals.

Notwithstanding the above, the Regulator's consultants have attempted the impossible task of pricing the project without detailed specifications. This appears to have been done without acknowledging this uncertainty, or an attempt to link the plausible range of reasonable and achievable risk allocation outcomes for HSB, with an associated range of required return outcomes. This is discussed in more detail in sections 5 and 6 below.

In summary, the three conditions above have to be viewed holistically given their interdependence, in order to ensure that the investment proposition under the new regulatory regime is deliverable in practice. However, the minded-to position does not appear to give appropriate consideration to either of the conditions above.

4.2.2 The model promotes cost efficiency (moves towards productive efficiency)

The second economic criterion against which a regulatory framework has to be appraised is its ability to promote cost efficiency, or productive efficiency. This is necessary in a regulated monopoly setting, to the extent that tying revenues to costs inherently removes the cost minimisation incentive of the regulated firm, which is naturally present in a competitive (unregulated monopoly) setting.

To ensure that regulated industries innovate, and provide least cost solutions to the benefit of consumer, regulatory design has to stipulate cost performance sharing mechanisms, which incentivise efficiency savings.

In the case of HSB, a large portion of the cost risk sits with the construction phase of the project, when all Capex is incurred. However, the minded-to position does not consider in detail what would be the optimal cost sharing mechanisms for Capex over/ under-spend to incentivize cost efficiency savings vs. shield NGET from cost risk exposure.

The Regulator appears to fall back on baselines from other frameworks, commenting that it plans to "adjust the application of the RIIO sharing factor", to avoid windfall gains and losses given "high contingency allowances".[17] However, this key parameter remains unspecified in the proposed CPM specification. Therefore, a key feature that defines the risk and incentives for investors in this model, does not appear to have been sufficiently considered.

The Regulator's impact assessment also appears to assume that CPM could deliver efficiencies of around 5% on both Capex and Opex, but no clear supporting evidence has been given on how these numbers have been derived in detail, and what aspects of the regulatory design ensure that they are achievable and realistic compared with the counter factual or alternative regulatory designs.

[17] Para 4.4 of minded to consultation.

4.2.3 The model promotes quality of service and value for money for customers

A third economic criterion against which a regulatory framework should be appraised is its ability to ensure best outcomes for customer relative to alternatives, including sustainable quality of service, optimal tariff design, as well as value for money for consumers, as discussed in the following sections.

4.2.3.1 Appropriate quality of service incentives are put in place

Quality of service incentives are necessary in a regulated monopoly setting to avoid an outcome where the regulated entity minimizes costs by sacrificing service quality. The minded-to position does not appear to consider these in detail beyond proposing to use the prevailing RIIO incentives (e.g. Energy Not Supplied). Although this may be appropriate, there is no further justification why this might be the case.

4.2.3.2 Appropriate consideration is given to optimal tariff profiling and tariff stability

It is also important in regulatory design to consider what is an optimal tariff design and revenue profiling from both the customer and investor perspective. For example, potential disbenefits to consumers from frontloading revenues (and therefore increasing tariffs) should be considered against the objective of ensuring that the project is financeable on proposed terms. From a customer perspective, it may not be optimal to frontload revenues if the social discount rate (as at the Treasury Green Book) is high and potentially higher than the cost of capital for regulated infrastructure investments, which would mean that it would be optimal to delay revenues from a customer perspective. The trade-off does not appear to have been considered.

4.2.3.3 Appropriate considerations are given to ensuring that the regulatory design overall delivers best value for money for customers relative to alternatives

The minded-to consultation provides a brief Value for Money assessment which is not detailed and appears to lack consideration of key features that driver value for money for customers in a regulatory setting. This is discussed in detail in the following section.

4.3 Value for Money (VfM) assessment

Value for money is an important consideration in designing a new regulatory framework. This part of the report sets out first the approach to the value for money assessment as set out in the consultation document. Then it provides comments on the assessment approach.

4.3.1 Value for Money (VfM) considerations in the minded to consultation

The consultation document provides relatively little information on the approach taken to consider the value for money for consumers under CPM. An impact assessment has been carried out to consider the merits of the two alternative models to the status quo under RIIO, under which the project would have been delivered through the SWW mechanism (see section 2 for background).

The impact assessment is based on comparing NPV of allowed revenues under the SWW approach to NPV of revenues under the two alternative models net of additional costs.

It appears that the impact assessment primarily considers three features of the two alternative models, namely:

- Lower cost of capital relative to the allowed rate of return under SWW;
- Lower Capex and Opex relative to the allowed Totex under SWW; and
- Shorter cost recovery period.

The consultation sets out that an adjusted RIIO price control financial model was used to project revenue profiles under the RIIO SWW framework, assuming an allowed cost of capital fixed over the full 45-year period. The Regulator states that a project finance model was used to project revenues under CPM. However, the assumptions that are reported to have been used in the project finance model, other than the cost of capital and the concession period, have not been disclosed.

The commentary in this section is based on the limited information available on the impact assessment as set out in the consultation document.

4.3.2 Comments on the Value for Money assessment

4.3.2.1 Consideration of alternative model design options that could deliver maximum value for money for consumers

In order to justify a new regulatory framework to capture potential additional meaningful benefits to customers without increasing costs, it is important to estimate the likely VfM that could be realised under the new regime compared with best possible alternatives. However, the VfM assessment of CPM, as presented in the minded-to consultation, is limited in scope and does not assess optimal model design options that could increase or reduce efficiency savings and long-term value for consumers.

There may be other alternative regulatory designs that could potentially deliver better Value for Money for consumers but have not been considered. As discussed above, key features of the proposed CPM regulatory framework have not been considered, with a view to find a regulatory solution that has the potential to deliver the highest efficiency savings and value for money for consumers. This includes considerations around: (1) depreciation profiles (choice of operational period over which Capex is recovered), (2) cost incentives (including sharing factor on Capex, optimal Opex updating frequency etc.), and (3) quality of service incentive (e.g. availability incentives).

The impact assessment concludes that CPM offers value for money for consumers because it has a net positive benefit relative to SWW, which it regards as a counterfactual.

It is unclear why CPM and SPV are the only models considered for delivery of the HSB project. There have been precedents of alternative delivery models for strategic projects in the UK by licenced incumbents. For example, Ofwat considered an adapted regulatory approach for the delivery of the £590 million Lee Tunnel (an underground tunnel used for storage and conveyance of untreated sewage) during the Draft Determination for its price review in 2009.[18] Another example is the regulatory approach to the construction of Heathrow's Terminal 5. The terminal was funded by Heathrow on its balance sheet under the existing license with a single cost of capital for the license. However, the Civil Aviation Authority applied a separate incentive mechanism, namely the five price triggers based on

[18] Ofwat (2009), Future water and sewerage charges 2010-15: final determinations, p.63.

stages of completion of Terminal 5.[19] The triggers reduced the maximum allowable charges if Heathrow missed particular project milestones.

More generally, a bespoke regulatory regime for on balance sheet delivery of HSB by NGET could be considered including a combination of different options concerning revenue profiling, cost and quality of service incentives.

4.3.2.2 Benefits and costs assessment under different regulatory options

The Regulator's VfM approach pre-assumes that CPM model could realize efficiency savings of 5%, but it is not clear on what basis it has established that those are achievable, and that consumers benefit from lower financing costs.

In general, different regulatory models would have different benefits including but not limited to their ability to achieve efficiency savings which crucially depends on the cost incentives embedded in the framework. The Regulator does not appear to consider this point when evaluating options, or indeed, what would be the optimal cost incentive rate (and associated expected efficiency saving) in the context of HSB.

Furthermore, differences in benefits across the models could exist as a result of e.g. reduced transaction costs under SWW which is an established and well understood framework, under which a first-of-a-kind premium would not be required, relative to the alternatives. Under a competitive model, on the other hand, customers would also benefit from a genuine competition from investors, as opposed to the proxy model where an outcome is hypothesised by the Regulator and imposed on the incumbent.

The Regulator's approach also lacks consideration of various additional costs including e.g. project management, or interface costs that should be factored under some specifications.

4.3.2.3 Discounts and profiling

Evaluating net societal benefits and value for money for consumers requires discounting social costs and benefits at the social discount rate, e.g. as stipulated by the HMT Green Book. The Regulator's analysis considers selected costs only and discounts them at a rate that is not disclosed.

Furthermore, since the social time preference rate is higher than the assumed cost of capital, postponement of revenues always benefits consumers. CPM, as proposed, includes a frontloading of revenues over a 25 year period based on an amortisation profile. The SWW model, in contrast, would see revenues spread over the 45-year asset life. The indexation of the regulatory asset value further delays revenues under SWW.

A 25-year amortisation profile would bring forward revenues and have substantial impact on consumer bills today as opposed to the future. The intergenerational issues arising from this frontloaded bill impact may not be optimal from the societal point of view.

[19] Civil Aviation Authority (2003), Economic Regulation of BAA London Airports (Heathrow, Gatwick and Stansted) 2003 – 2008 CAA Decision, page 5.

4.3.2.4 Sub-optimal risk allocation

Different delivery models have different risk allocation between different stakeholders including customers, debt providers, equity providers and the government. For example, CPM may have a post-construction assessment of allowed operational WACC. This partly transfers re-financing risks to consumers, who may not be the most appropriate party to manage such risks. Sub-optimal risk allocation between consumers and investors will deliver inefficient economic outcomes, because it implies that risk is not in the hands of those that can manage it at least cost. This has cost implications for the VfM assessment, which the Regulator has not considered.

4.3.2.5 Consideration of CPM costs

The impact assessment includes an additional cost for designing and implementing CPM to the tune of £150,000-£300,000 in total over the 25-year period. It is unclear if this is a cost expressed in NPV terms, an on-going cost or only an upfront cost.

In practice, CPM as proposed would likely require additional on-going costs reflecting additional reporting and compliance monitoring activities incurred by both NG and the Regulator. The cost could be particularly high during the post-construction review, which in many respects is akin to another price review.

A competition model would require even higher additional on-going costs for contract management, particularly if the project is delivered by multiple parties. These costs would be reflected in the pricing of competitive bids.

The additional costs in the impact assessment are partially offset by cost efficiency assumptions, which are based on OFTO precedent. However, OFTO precedents may not be directly relevant given that OFTO competition is confined to the financing and operating activities of offshore transmission. By contrast, HSB is a Capex-heavy project with substantial construction risk, which differs in nature and cost of management relative to OFTOs.

Additionally, the consultation does not set out how CPM could lead to cost efficiencies, beyond the anticipated, but largely unspecified levels of cost sharing factors. For example, the proposed CPM envisages a post-construction review for operating expenses. This could potentially lead to a sub-optimal contracting arrangement, given the uncertainties in what would be the final cost allowance, which may translate into lower cost efficiencies achieved under CPM.

4.3.3 Conclusions

In order to justify a new regulatory framework to capture potential additional meaningful benefits to customers without increasing costs, it is important to estimate the likely VfM that could be realised under the new regime compared with best possible alternatives. However, the VfM assessment of CPM, as presented in the minded-to consultation, is limited in scope and does not assess optimal model design options that could increase or reduce efficiency savings and long-term value for consumers.

The assessment is limited in terms of key model design features that are considered and assessed for their ability to deliver efficiency savings, and also in terms of the number and specification of best possible alternatives. Instead, the VfM focuses on reflecting what are, in

effect, pre-assumed savings from financing under CPM compared with only one, stylised counterfactual.

The VfM also does not fully consider the full spectrum of benefits and costs associated with different model design options, what should be the optimal tariff profiling, or the cost implications from sub-optimal risk allocation.

5 Commentary on the proposed specification of CPM

The stated objective of CPM is to replicate the outcome of introducing a competitive process to the delivery of HSB. The question whether this is the right objective for the regulatory design in the HSB context has been addressed earlier. This chapter considers to what extent CPM as proposed in the consultation document meets this objective, and discusses implications.

The chapter is structured as follows:

- It first discusses a typical structuring and financing features of a competitively-tendered standalone infrastructure project;
- It then examines the features of CPM as proposed from the perspective of a typical structuring and financing of a competitively-tendered standalone infrastructure project; and
- Finally, it concludes on whether CPM as proposed has met the stated objective and discusses implications on CPM as a proxy for competitive process.

5.1 Features of a typical standalone structure and financing of an infrastructure project

This section discusses the characteristics of a typical standalone infrastructure project – both on project structuring and financing – that is competitive procured. The purpose of this outline is to set a benchmark against which CPM can be assessed on its ability to deliver on its stated objective of mimicking a competitive outcome.

CPM as proposed is intended to represent a model where a third party is engaged to build, finance and operate an infrastructure asset on a competitive basis. In the UK context, a typical Private Finance Initiative ("PFI") project, which are delivered through a project finance model, is generally considered to reflect the outcome of an efficient competitive process for the financing, construction and operation of an infrastructure project.[20] The consultation document acknowledges that in a competitive environment HSB is likely to be financed and delivered through a project finance model.

Project finance is a way of structuring and raising financing for e.g. a long-term infrastructure asset. Financing is typically provided on a non-recourse basis, i.e. the capital repayment is reliant entirely on the projected cash flows of the project with no recourse to the balance sheet of the sponsors. As a result, certainty in the project cash flows plays a significant role in determining the pricing and the structure of financing for the project.

The degree to which project finance can deliver value for money for customers fundamentally depends on (a) the risk allocation between different parties and (b) the financial structure adopted within the project finance model. Any lack of clarity around these two fundamental areas implies that the costs and benefits of the approach that relies on project finance and

[20] House of Commons (2015), PFI: costs and benefits, briefing paper number 6007

the implied pricing cannot be determined with certainty. The discussion in this section is organised around these two areas.

There are strong similarities between what CPM is intended to reflect and the PFI model adopted by the UK government. Most notably, both relate to the use of competition to build, finance and operate infrastructure assets through a long-term contractual arrangement with a fixed revenue stream. Both assume and rely on project finance as the mode to deliver the infrastructure.

5.1.1 Approach to risk allocation

A key feature of project finance is the upfront specification of risk allocation across different parties to maximise the visibility and certainty of cash flows to the project company at the tendering stage. This is a pre-requisite for the non-recourse financing structure whereby lenders rely primarily on future project cash flows for repayments. A typical project finance structure allocates risks to different parties best placed to manage them in a cost effective way in order to minimize residual project risk. For CPM to be a meaningful reflection of standalone project structuring and financing under a competitive model, it is therefore critical to address the risk allocation points in detail.

5.1.1.1 Construction risk

Construction risk includes construction cost overrun and construction delay. It is typically allocated to the project company. Normally, the project company would pass down substantially all construction risks on a back-to-back basis to a contractor under a fixed-price date-certain construction contract.[21] This maximises the certainty over construction costs, and ensures sufficient financing is raised during the construction period to ensure project completion.

This is achieved by specifying upfront at the tender stage the detailed terms around construction risk sharing. The construction risk allocation will form the basis for the construction contract between the project company and the contractor.

In exchange for bearing construction risks, the contractor would normally price in construction risk allowance in the contract price. This is estimated to increase the contract price by around 5-10%[22] relative to the contract price without a fixed-price date-certain provision. PFI projects may also charge higher prices for construction to cover unforeseen costs[23]. The premium on construction costs may also be higher where the project is a first of its kind to be delivered through the project finance model.

5.1.1.2 Availability risk

Depending on the nature of the project, the project company's cash flows may be exposed to either or both of demand and availability risks. For the purposes of this report availability risk is considered as the consultation document assumes that the HSB will be exposed only to availability risk.

[21] Moody's (2014), Construction Risk in Privately-Financed Public Infrastructure Projects, p.3
[22] PwC (2016), Investing in Infrastructure – International Best Practice in Project and Construction Agreements, p.77
[23] NAO (2018), PFI and PF2

Availability risk is the risk that the asset becomes unavailable during the operation period. A typical PFI projects entails a performance regime where deductions are made for performance failures. The performance regime has an impact on the ability of the project company to repay its debt, and is a key consideration for lenders as noted in the Guide to Infrastructure Financing. The Guide to Infrastructure Financing as published by the Association for Financial Markets in Europe notes that:

"One of the most material risk factors in project finance debt from the point of view of both banks and project bond investors is revenue risk, or the risk that either expected volume and/or price will be not be achieved going forward "[24]

Normally, the project company would engage a sub-contractor to operate the asset during the operational period. The contracting would pass down substantially if not all availability risks to a contractor on a back-to-back basis.[25]

As with the construction contract, the sub-contractor would price in a risk allowance to absorb availability risk during the operational period. This requires the specification of the performance regime to be specified upfront.

5.1.1.3 Counterparty risk

Counterparty risk is the risk that the procuring entity would not be able to pay the contracted revenue to the project company. This will affect the ability of the project company to service its debt and hence the credit quality of the contracting entity would often set a cap on the credit quality of the project company, in absence of credit enhancements.

Moody's notes that:

"The credit quality of a counterparty to which an issuer is materially exposed could exert downward pressure or act as a cap on the actual rating of an operating PPP, even if the issuer's grid-indicated rating is higher."[26]

In the UK, the majority of the PFI projects have been delivered with a government entity as the counterparty. For example UK hospital PFI projects benefit from financial support mechanisms provided by the UK Government to project companies.[27] This virtually eliminates the counterparty risk from the project.

5.1.1.4 Regulatory risk

Regulatory risk is the risk that the contracted revenue stream may be revisited after the contract has been agreed. Under a typical PFI project, the contracted revenue stream is generally fixed upfront corresponding to the bid at the tendering stage. Any potential revisions to the contracted revenue will be agreed upfront and documented as part of contractual provisions. This is so that project sponsors and lenders can model different adverse scenarios to form their view on the required rate of return at the bidding stage. This is noted by the Guide to Infrastructure Financing as the risk that:

[24] Association for Financial Markets in Europe (2015), Guide to Infrastructure Financing, p.30
[25] Moody's (2015), Operational Privately Financed Public Infrastructure (PFI/PPP/P3) Projects, p.12
[26] Moody's (2015), Operational Privately Financed Public Infrastructure (PFI/PPP/P3) Projects, p.29
[27] Moody's (2016), UK PFI projects sheltered from deteriorating NHS Finances

"The forward-looking approach involves procurement authorities and sponsors anticipating possible adverse scenarios and their implications for private sector investors"[28]

5.1.1.5 Post contract obligation risk

Post contract obligation risk is the risk that the asset will not perform satisfactory after the end of the contracted operational period. This is relevant for assets such as HSB where the asset life is longer than the contracted period. This risk is typically allocated to the project company, with the project company required to provide capital and resources to ensure the assets are handed over to the authority at the end of the contract as per the agreed terms. The contract would also generally have a provision for retention funds, performance bonds or guarantees to commit delivering on the hand-back obligations.

5.1.2 Financial structure

Appropriate risk allocation along with certainty on project cash flows would enable a project finance company to achieve significantly higher leveraged financial structures compared to the project delivery on balance sheet. A higher financial leverage amplifies the impact of inherent project risks on the project cash flows to debt and equity holders. There is a clear link between the attainable financial structure and the project risk allocation.

5.1.2.1 Whole-of-life contract approach

Innovation and value addition under a competitive tender is normally achieved by the bidder taking a whole-of-life approach to the development of the infrastructure.[29] A project finance model typically includes design, construction, operation and maintenance for an extended time period sufficient to recover the original capital investment.

The benefit of an integrated construction and operations phase is a key features of project financing involving construction. The whole-of-life approach also enables the investors in competitively tendered infrastructure projects will offset higher risk or cost variability in some areas with higher potential returns in other areas to achieve their target equity return over the entire project.

5.1.2.2 Debt financing

A typical project finance transaction has debt financing in place for the duration of the contract at the tender stage. Most PFIs have a fully amortising debt structured, sculpted to match the revenue profile. This is to ensure sufficient financing throughout the construction period as well as to minimise refinancing risks.

For example, the Aberdeen Western Peripheral Route PFI is a 30-year availability-based PFI involving the construction of new roads, bridges and access tracks. The project raised £274 million of term loans and £193 million of project bond up front covering the entire contract tenor.[30]

In some instances, PFI projects were delivered with a shorter debt term compared to the full contract period or with increasing cost of debt over the life of the project to motivate the

[28] Association for Financial Markets in Europe (2015), Guide to Infrastructure Financing, p.9
[29] Select Committee on Economic Affairs (2010), Private Finance Projects and off-balance sheet debt Volume II: Evidence, p.52
[30] Inframation Deals database

project company to refinance its debt during the contract period. This however exposes the project company to refinancing risks as emphasised by Moody's:

"A project that requires access to the debt markets during the tenor of the project agreement increases credit risk given the uncertainty of the issuer's ability, at a future point in time, to achieve credit terms that are manageable given its essentially fixed revenues…Refinancing risk can have up to four notches of negative impact on the grid-indicated rating…"[31]

5.1.2.3 Credit strength of the project assessed over the contract tenor

The credit strength of the project company will determine the extent to which the project is attractive to capital providers. Project companies with higher credit strength will be able to attract a lower cost of capital. Where the project company seeks to raise through public or private bond issuances, independent credit rating of the project is a perquisite.

Credit rating agencies evaluate the credit strength of a project over the life of the project, or the contract period if it is shorter than the useful life of the project, taking into account various risk factors during the project life. AFME notes in its Guide to Infrastructure Financing that:

"Credit rating agencies consider the project's risk profile throughout its whole life, and the 'weakest link' in the project may limit its rating….More specifically, assessing a project's credit risk involves analysing the potential risks that may impact a project throughout its life…including areas of subjective judgement "[32]

In practical terms, the credit rating agencies may evaluate the credit strength of a project separately for the construction and operation phases. However the project is awarded a single credit rating, which invariably will be determined by the lower of the credit rating between the construction and operation phases.

For example, the Mersey Gateway PFI is a 30-year availability-based PFI involving the building of a new six lane toll bridge over the River Mersey. The project issues a project bond worth £257 million at financing close with a duration covering both the construction and operational phases. The bond was given a single rating of Aa1 by Moody's covering both phases.[33]

5.1.2.4 Driving value through covenants

In addition to a well-defined risk allocation and higher certainty on cash flows, project finance companies use a wide range of covenants and other contractual mitigations (such as step-in rights) to protect lenders against default.

The main covenant under the financing agreements is the requirement to maintain a minimum debt service coverage ratio ("DSCR"). DSCR is measured as a multiple of the cash flow available to service debt obligations due within one year. Other covenants may include minimum interest cover ratios and loan life cover ratios.

For example, High Speed Rail Finance PLC is a project finance company responsible for the operations, maintenance and renewal of the track and railway stations for High Speed 1. The bonds issued by the project company include a covenant preventing a shareholder

[31] Moody's (2015), Operational Privately Financed Public Infrastructure (PFI/PPP/P3) Projects, p.24
[32] Association for Financial Markets in Europe (2015), Guide to Infrastructure Financing, p.34
[33] Inframation Deals database

distribution should the DSCR fall to less than 1.20X on both a 12-month back-looking and forward-looking basis.[34]

Additional lender protections may include reserve facilities or reserve accounts for debt service ("DSRA"), maintenance and lifecycle costs ("MRA") and performance requirements during the operational period. The size of reserve accounts will vary with project costs and the terms of the covenants, which are in turn a function of project risk allocation.

For example, the bonds issued by High Speed Rail Finance PLC includes a 12-month debt service reserve facility.[35] There are financial costs associated with maintaining these facilities which may offset some or all of the benefit of a lower cost of capital achieved through higher gearing.

5.1.2.5 Use of financial model

Because of inter-linkages between various elements over the project life, project finance requires a financial model to forecast cash flows. Lenders require a financial model to assess credit risks and determine the appropriate level of gearing and the repayment profile.[36] The lender would determine the maximum amount it is willing to lend to the project company based on its projection of the DSCR over the project life. Debt payment profile is sculpted to mirror a forecast project cash flow profile, resulting in varying gearing over the project life trending to zero towards the end of the project.

The project sponsor requires the model to estimate revenue requirements to achieve target equity returns. Investors expect a smooth gearing glide path between construction and operations. Any step-change in gearing during the contract period would expose the project to refinancing risks. The financial model helps to achieve the final outcome that the combined risk-return allocation over the life of the project is optimal, and internally consistent.

5.2 The proposed features of CPM

The critical features of the project finance structuring and financing under competitive tendering as outlined in the previous section can be compared with the level and detail of specification under CPM. The overarching problem with CPM is it either does not specify in detail all these key aspects of a project finance model based on competitive tendering, or is inconsistent with these typical features.

This section examines the features of CPM as proposed from the perspective of a typical structuring and financing of a competitively-tendered standalone infrastructure project.

5.2.1 Approach to risk allocation

The consultation sets out an outline of the contractual structure under CPM. Certain aspects of CPM framework are more specified than others. The discussion here is based on the details as provided in the consultation document.

[34] S&P Global Ratings (2016), New Issue: High Speed Rail Finance PLC
[35] Ibid.
[36] See discussion in BBVA (2006), Financing PPPs: Project Finance, for example

5.2.1.1 Construction risks

The CPM envisages separate treatment between controllable and uncontrollable Capex. Controllable Capex is set up front and subject to a risk-sharing between the project finance company and customers. However, the risk-sharing rate is unspecified. Uncontrollable Capex is subject to pass-through but subject to post-construction efficiency review.

The distinction between controllable and uncontrollable Capex allocates risks to the party that is best placed to manage them. This is consistent with a typical project finance arrangement. The risk-sharing arrangement on controllable Capex also de-risks the construction risks. To the extent that the risk-sharing is back-to-back to the contractor, the contract construction price would also likely be lower than under a fixed-price contract.

However, the Regulator has not considered the impact of the construction risk transfer from the project company to the contractor on construction contract price. A fixed-price construction contract for HSB would have a higher contract price, reflecting construction risks priced in.

In addition, uncontrollable Capex is subject to a post-construction efficiency review. By definition, this process will happen after the contract signing date. The scope of the review has not been defined. This process creates uncertainty in project cash flows as the final revenue profile would not be known until the post-construction review.

Facing this uncertainty, lenders may be unwilling to lend or require a stricter level of debt covenants to protect themselves against an adverse outcome. This would limit the level of gearing HSB could achieve. It would also increase costs associated with debt covenants as a larger reserve facility would likely be required.

5.2.1.2 Availability risk

The CPM involves an availability-based payment mechanism, subject to a performance regime with penalties for asset unavailability. However, the performance regime has not been specified.

An availability-based payment reduces revenue risks for the project. Given that HSB has no control over transmission volumes, it allocates risks to the party that is best placed to manage them. This is also consistent with recent PFI schemes in the UK where revenues are based on availability.

Unlike a typical project finance project, the CPM as proposed does not specify the required availability targets and incentive payments for out/under-performance against the targets. This creates a risk that the performance regime may not be achievable or might create additional risks and costs to the project.

As with the construction risk, lenders may be unwilling to lend as HSB risks cannot be reliability modelled. Alternatively, they may require the project to hold a higher level of performance reserve. This would limit the level of gearing and increase financing costs for HSB.

5.2.1.3 Counterparty risk

The CPM as proposed does not envisage a separate license for HSB. By implication, the project company would enter into a contract with NGET being the counterparty.

NGET is an investment-grade company and therefore the counterparty risk is low. Nonetheless, this is a departure from a typical PFI project in the UK where the counterparty is usually a local authority or a government entity. NGET's credit rating is lower than the sovereign rating for the UK.[37] As Moody's has noted, counterparty risk can have a significant impact on the project's credit rating. Therefore, lenders may require additional level of covenants to protect themselves against a higher counterparty risk. This would limit gearing and increase financing costs.

5.2.1.4 Regulatory risk

The CPM stipulates that additional Capex or maintenance Capex for HSB would be set under the 'prevailing' arrangements. Furthermore, the final Opex allowance would be set at the post construction review.

A typical project finance would require additional Capex and maintenance Capex profile to be specified up front. Lenders would require a lifecycle cost reserve to be held to ensure sufficient cash is retained within the project company to fund the additional Capex without requiring additional debt or equity. For example, OFTOs, have a clearly specified risk in this area, where OFTO investors have the right not to undertake investments that are larger than 20% of the final transfer value of the asset.

In addition, the post-construction review for Opex poses challenges from the project finance perspective. It creates revenue uncertainties which affect lenders' perception of project risks and increase the cost of capital for the project.

Overall, the combined effect of regulatory risks under CPM is likely to lead to higher financing costs for HSB than the level observed for a typical PFI project. This reflects a potentially bigger lifecycle cost reserve to deal with uncertainties around additional and maintenance Capex. Uncertainties around the final Opex allowance would also lead to a stricter covenant requirement and/or equity return to build headroom to absorb such risks.

5.2.1.5 Post contract obligation risk

The CPM envisages an operational period of 25-year with the asset transferred to NGET at the end of the contract at zero asset value. At which point NGET will assume the operation of HSB until the end of the asset life. The CPM has not considered the post-contract obligation risk after the contract period.

The post-contract obligation risk is not a risk to the project company, but it is a risk to NGET. Typically, the contract would have a provision for retention funds, performance bonds or guarantees to commit delivering on the hand-back obligations for assets that are expected to last longer than the contract period.

[37] See http://investors.nationalgrid.com/debt-investors/credit-ratings

5.2.2 Financial structure

The CPM as proposed does not have a prescribed financial structure. However, the proposed rate of return under CPM is based on a number of assumptions on the financial structure, including:

- The construction phase rate of return is based on a CAPM based estimate. The cost of equity is consistent with a cost of equity for traded construction companies. The cost of debt assumes a rating towards the lower end of the A to BBB range;
- The operational phase rate of return is based on the cost of equity from OFTO projects and the cost of debt consistent with a rating towards the higher end of the A to BBB range; and
- Gearing is fixed during the construction phase. There is a refinancing at the end of the construction phase, resulting in a step change in gearing between the construction and operational phases.

Considering the likely financial structures that may be adopted by competitive bidders is a critical factor in structuring a model for tendering in order to make it financeable on a standalone project finance basis.

Given that the analysis by the Regulator and its consultants does not explicitly consider possible approaches to financing that could be realistically adopted by bidders, it lacks a critical driver of the model specification. CPM is a design of a model not informed by considerations of how it could be financed.

5.2.2.1 Whole-of-life contract approach

The proposed rate of return for CPM assumes different financial structures between the construction phase and the operational phase. The cost of equity as well as the cost of debt approaches are different between the construction phase and the operational phase.

In practice, investors and lenders do not treat the two phases as separate. Equity investors will seek to offset higher risk or cost variability in some areas with higher potential returns in other areas to achieve a target equity return over the entire project. Lenders will assess project risks over the entire project to arrive at the lending conditions.

Furthermore, the rate of return for the operational phase is based on competitive benchmarks for the operational phase of the project (e.g. OFTOs, based on project financed models). The discussion in section 5.2.1 suggests that it may not be appropriate to use competitive benchmarks for CPM as proposed due to a number of features that are not aligned with a typical project finance approach. Therefore, it cannot be concluded that the proposed allowed return would fully reflect a competitive outcome over the life of the project.

5.2.2.2 Debt financing

The proposed rate of return for CPM assumes that debt is issued in two stages. The first stage involves a short-term debt raised upfront to cover the construction period. The second stage involves refinancing the short-term construction debt with a longer-term debt to cover the full 25-year operational period. It also assumes that additional debt will be issued at the end of the construction period to increase gearing for the project.

The discussion in section 5.1.2.2 suggests in practice project debt is raised upfront to cover the entirety of the contract period including both the construction and operational phases. Otherwise, the project would be exposed to refinancing risks at the end of the construction period. Moody's suggests that the impact on the project credit rating could be up to four notches lower for projects requiring refinancing during the tenor of the contract.

Therefore, the underpinning debt financing assumptions for CPM do not align fully with a typical project finance structure. Assuming refinancing would increase both the cost of debt and the cost of equity for the project due to refinancing risks.

5.2.2.3 Credit strength of the project assessed over the contract

The proposed rate of return for CPM assumes that the short-term construction debt would be rated towards the lower end of the A-BBB. The longer-term operation debt is assumed to be rated towards the higher end of the A-BBB range.

As discussed in section 5.1.2.3, rating agencies in practice would assign a single rating for the entire project. The rating would be based the lower of the rating for the construction and operational phases. Therefore, it cannot be assumed that the cost of debt assumption for CPM might be achievable under a typical project finance arrangement.

5.2.2.4 Driving value through covenants

The proposed rate of return for CPM assumes the cost of debt based on market benchmarks. Separate allowances have been made for transaction and carry costs. However, there were no considerations for the required level of covenants.

As discussed in section 5.1.2.4, project finance achieves a low cost of debt through a highly covenanted structure. The level of covenants varies with the allocation of project risks as well as the target credit rating. The level of covenants increase with the level of project risks allocated to the project company and the target credit rating.

The proposed rate of return for CPM assumes an investment grade credit rating for the project. Given the non-standard risk allocation for CPM as proposed, the required level of covenants consistent with an investment grade rating is likely to be higher than the level observed for a typical project finance deal. Therefore, the cost of debt assumption for CPM is unlikely to be achievable. Factoring the cost of maintaining covenants would further raise financing costs beyond the level currently assumed for HSB.

5.2.2.5 Use of financial model

The proposed rate of return for CPM is based on weighted average of the assumed cost of debt and cost equity. Different gearings are assumed for the construction phase and the operational phases.

In practice, there are inter-linkages between various elements of a typical project finance structure. For example, gearing is determined as a function of the required credit ratios. The required credit ratio is a function of the allocation of project risks. Debt repayment is sculpted to match the project's cash flows, causing gearing to vary over the contract tenor.

Without a project finance model, it is unclear whether the proposed rate of return would be internally consistent with other aspects of CPM as proposed. For example, it is unclear if the

proposed rate of return would allow the project sufficient revenues to maintain credit ratios consistent with an investment grade rating assumed. It is also unclear if the cost of debt, after factoring in covenant costs, is consistent with the cost of debt assumed. Therefore, in absence of a detailed financial modelling, there are risks that the assumed financial structure and the rate of return for CPM are not achievable in practice.

5.3 Implications

The stated objective of CPM is to replicate the outcome of introducing a competitive process to the delivery of HSB. However, a comparison between the features of CPM as proposed and the features of a typical project finance suggests that CPM as proposed does not reflect a competitive model with respect to the risk allocation and the financial structure.

In terms of the risk allocation, CPM as proposed departs from a typical project finance structure that would be expected to result in a competitive outcome in the following key respects:

- Construction risk: The allocation of construction risk is not fully specified in terms of the scope of the post-construction review and the risk-sharing rate. It is unclear if the allowed construction cost will reflect construction risk allowance under a fixed-price contract;
- Availability risk: The availability target has not been set and the level of incentive payments is not defined;
- Counterparty risk: NGET, not a government entity, is the project counterparty;
- Regulatory risk: There are scope for regulatory discretions around additional and maintenance Capex and final Opex allowance; and
- Post-contract obligation risk: NGET will assume the responsibility for HSB after the end of tenor life but without provisions for hand-back obligations.

The departure in terms of the risk allocation has a number of implications for the financing of HSB in a competitive setting.

First, the non-standard risk allocation will reduce appetite from investors and lenders. This would lead to higher financing costs relative to a standard project finance deal such as PFIs where risk profiles are well understood. Therefore, a benchmark return based on a typical project finance deals would not be appropriate.

Second, the departure may result in a risk allocation that is not optimal from the perspective of the value of money for customers. For example, the market would price in the counterparty risks associated with having a non-government entity as a counterparty.

In terms of the financial structure, the underlying assumptions on the rate of return under CPM depart from a typical project finance structure in the following respects:

- Whole-of-life contract approach: Separate treatment for construction and operational periods is not aligned with the market practice of considering both phases jointly to maximise value;
- Debt financing: Assuming two-stage debt financing is not aligned with the market practice of arranging debt upfront to avoid refinancing risks. Gearing is assumed fixed when it would vary over the contract tenor in practice. Covenant costs have not been considered;

- Rating assessment: Assuming different ratings for each phase of the project is not aligned with a standard rating methodology of assigning one rating over the contract tenor; and
- Financial modelling: The financial structure has not been optimised using a financial model.

The assumed financial structure underpins the estimated rate of return for CPM. For the reasons set out above, the financial structure assumed represents a significant departure from the structure expected for a typical project finance approach. There have been no precedents for such a financial structure so it may not be achievable in practice. To the extent that the assumed structure is not achievable in the market, it would not be appropriate to estimate returns for CPM using benchmarks based on a typical project finance deal.

6 Commentary on the proposed methodology for setting the WACC for HSB

This section discusses key issues with the methodology for calculating the WACC for HSB proposed by Ofgem's consultants.

6.1 Misalignment of CPM features and WACC assessment

A number of key features of the regulatory framework underpinning CPM remain undefined, due to which the risk allocation between the key stakeholders in the project—investors and consumers—remains largely unspecified. For this reason, any attempt to price the HSB investment under the proposed CPM would be expected to have a very wide confidence interval, given the uncertainty around the final risk allocation outcome.

Key features of CPM that remain undefined—and that would have substantial impact on the market hurdle rate for this investment—broadly include (see section 5 for details):

1 CPM does not have clearly defined cost risk:
   - Capex: the cost sharing parameters under CPM are not defined at present, nor is there a precise definition of "controllable" vs "uncontrollable" costs during construction, where only the latter will be subject to pass-through;
   - Opex: the operator bears Opex risk under CPM, subject to an unspecified materiality threshold;
   - Construction delay: the treatment of delay is subject to Ofgem's discretion.

2 CPM does not have clearly defined revenue risk: for example, it is not clear whether the required availability threshold will be achievable, and/or what the incentives for outperformance would look like.

3 CPM does not include a clearly defined refinancing risk: it is unclear whether NG would bear risk that Operation WACC does not reflect market conditions at Post-Construction review.

Specification of a return allowance under CPM at present would need to address the wide range of risk allocation outcomes that remain on the table. The minded-to consultation as well as associated cost of capital estimates by the regulators' consultants, do not appear to acknowledge this uncertainty, nor do they attempt to link the plausible range of reasonable and achievable risk allocation outcomes for HSB, with an associated range of required return outcomes.

6.2 The overall approach to calculating the Cost of Capital for HSB

The proposed methodology for assessing the required cost of capital for HSB treats the construction and operation phases of HSB as separate:

The proposed construction WACC is based on a CAPM approach. In theory, the CAPM can be applied in a way that is consistent with a competitive outcome, if e.g. the beta is based on relevant comparators whose risk profile matches that of the project, and if appropriate premia for asymmetric risk are applied to reflect the return requirements of construction projects with substantial downside risk. However, the proposed CAPM application in the minded-to consultation does not appear to closely examine the risk profile of the wide set of benchmarks it uses to assess construction risk (notwithstanding the fact that the risk allocation for HSB is not yet clearly defined), nor does it appear to recognize and address the issues that arise when CAPM is applied to large Capex projects with substantive downside risk. It is therefore unlikely that the proposed construction WACC would be consistent with a competitive outcome. We discuss this further in section 6.3 to 6.4 below.

The proposed operational WACC is based on competitive benchmarks for the operational phase of the project, namely OFTOs, where these are based on project financed models. Therefore, the operational WACC does not rely on a bottom up estimate of the required returns except for consideration of market parameter (e.g. TMR, RfR) in so far as they feature in the OFTO benchmarks. OFTO benchmarks have been used without establishing a clear link between the risk allocation achieved in those project financed models, and the risk allocation (that would be) embedded in the regulatory framework that underpins CPM, and without due regard for some of the proposed features of CPM which could indicate higher risk than OFTOs, e.g. as a result of longer operating period, and no clearly specified pass-through costs. Even if risk allocation were fully specified, the OFTO benchmarks are poor comparators for HSB for a number of reasons: OFTOs are multiple, smaller, simpler, mature, competitively tendered projects based on a regulatory regime whose deliverability has been tested in practice over several rounds of tendering. In contrast, HSB, as proposed, is unique, large, complex, new, ‘first of a kind’ (from a technical, market and regulatory perspectives), not competitively tendered, and based on a proposed regulatory regime, which is not fully specified. This is further discussed in section 6.5 below.

Therefore, phase-specific required returns could in principle be estimated for each project phase if overall risk is appropriately allocated to and priced under each phase. However, the proposed approach ensures that neither each of the phase-specific returns is consistent with the risk profile assumed in each phase, nor that when taken together, they are consistent with the overall project return that would result in a competitive outcome. Neither the minded-to consultation nor the report by the Regulator’s consultants considers the implied overall project return for HSB and its consistency with likely target returns required by bidders in a competitive tender.

6.3 CAPM, downside and project specific risk

The CAPM is a standard tool in asset pricing with extensive use in UK (and international) regulation. The model requires all downside outcomes and potential losses to be incorporated in the project specific cashflows before the premium for risk (i.e. variance of returns around expected cashflows) is determined. If the assumed cashflows e.g. based on the allowed revenues, are not adjusted for such downside events, as appropriate, the CAPM-derived required returns have to be adjusted.

Infrastructure projects could result in significant losses due to e.g. construction cost overruns or delays, or commissioning issues. These potential losses have to be compensated for in the upside for the investment to represent 'a fair bet' in addition to a premium for risk around the expected returns.

Regulators of utilities in the UK do not typically price specific downside scenarios assuming that regulated companies can on average recover the allowed returns. This might be acceptable on the basis of large portfolios of assets, with limited losses in downside scenarios under typical economic regulatory frameworks. However, on a project specific basis, where losses in particular states of the world could be very significant and are not reflected in the allowed cashflows, such losses have to be priced in separately, on top of the CAPM derived risk premia. For example, in the case of a recent price appeal by SONI, CMA has recognized significant downside risks in the case of major projects and determined an explicit premium for cost overruns in such projects.

In project finance, given that financial models typically assume promised cashflows, target returns are adjusted for the possibility of losses in certain downside scenarios. In practice, this is typically captured by premia for specific risks.

In addition, UK economic regulators have in several cases recognized the impact of the potential relationship between large investments, asymmetric risks and beta:

- CAA considered downside asymmetric risk when assessing BAA's Cost of Capital allowance and impact from Terminal 5: "Large investment projects tend to be risky in a number of ways. The scale of Terminal 5 will increase BAA's risks, not only with respect to construction risk but also risks of uncertain demand and risks associated with the Terminal 5 triggers as pointed out by the Competition Commission. Regulatory commitment is another issue influencing risk".[38] The CC then allowed 25 bps to the BAA WACC to account for asymmetric downside risk for Terminal 5.[39]
- In the Bristol Water Appeal of PR14, the CMA considered it was "good regulatory practice" to consider asymmetric downside: "We consider it good regulatory practice to consider the impact of downside shock on financial ratios."[40]
- The UK Joint Regulators Group also recognizes the need to remunerate and account for downside scenarios across the regulated sectors: "The financeability of each notionally-financed company is typically tested under both the 'base' scenario (allowed revenue set at the beginning of the price control) and also stress tested against a number of other scenarios or events (depending on the sector under review)".[41]

[38] See (February 2003) CAA: Economic Regulation of BAA London Airports, p.44. Accessed here: http://webarchive.nationalarchives.gov.uk/20140605063754/https://www.caa.co.uk/default.aspx?catid=78&pageid=11827

[39] Competition Commission (November 2002), BAA plc: a report on the economic regulation of the London airports companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd), Chapter 4 Financial Performance and Cost of Capital, para 4.71 – 4.72.

[40] See CMA (October 2015), Bristol Water Plc, Final Determination, para 11.52, accessed here: https://assets.publishing.service.gov.uk/media/56279924ed915d194b000001/Bristol_Water_plc_final_determination.pdf

[41] Joint Regulators Group, Cost of Capital and Financeability, para 3.22, accessed here: https://www.ofgem.gov.uk/ofgem-publications/37070/jrg-report-cost-capital-and-financeability-final-march-2013-pdf

Despite extensive recognition of asymmetric downside risk in UK regulation, the cost of capital assessment proposed in the minded-to consultation for HSB does not appear to account for this deficiency in the CAPM framework.

Finally, even if the regulatory framework were fully specified and risk sharing were fully delineated and appropriately priced under the CPM model, first time investors would have likely factored in a 'novelty' or 'first of a kind (FoAK)' premium to the required return if the investment went to market, to the extent that CPM is a new regulatory regime whose deliverability would not have been previously tested. This is because investors generally require a higher return for a (technical and regulatory) 'first of a kind' assets, driven by their inexperience with the regulatory framework and technical characteristics of the assets, and associated cost / output outperformance potential.

For example, it is plausible that the fall in required IRRs in the OFTO regime is at least to some extent attributable to maturity of the framework, and investors gaining a better understanding of the risk of the projects and the cost of managing those risks, the achievable outperformance on the assets, as well as various other elements on how the regulatory framework would actually work in practice, and associated implications for cost and return.

That novel regulatory regimes require a premium has been recognized, for example, by the UK Department of Energy and Climate Change (now BEIS) who, upon advice from economic consultants, accepted that the new regulatory regime introduced for subsidizing renewables in the UK, namely the Contract for Difference Feed in Tariffs (CfD FiTs) introduced as part of the UK's Electricity Market Reform, should incorporate a "novelty premium" of 25bps, for assets commissioned in the First Delivery Plan Period, on grounds that there may be "uncertainty associated with how the regime and institutions would work".[42]

The proposed cost of capital estimates for HSB do not appear explicitly to consider or account for the novelty of the regulatory regime, and the additional layer of uncertainty this would create for investors if the project were to go to market.

6.4 CAPM parameters employed for the proposed Construction WACC

The Regulators' consultants take a CAPM approach to calculating a Construction WACC for HSB. This section comments on the application of the CAPM model as a tool for pricing risk during construction for HSB.

Key parameters that affect the proposed Construction WACC include the Total Market Return (TMR), the asset beta of the project, the gearing assumption, and the credit rating during construction. These parameters are discussed in turn below.

6.4.1 Total Market Returns (TMR)

The proposed Construction WACC for HSB is based on a TMR approach, whereby the ERP is set as a residual of the TMR less the RfR. The TMR for HSB is based on a wide set of data including historic average realized total equity market returns (Credit Suisse Yearbook,

[42] See DECC (December 2013), Annex H: Modelling Assumptions: Changes to modelling assumptions in response to Draft Delivery Plan Consultation responses and other evidence. Accessed here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267960/Annex_H_-_Modelling_Assumptions.pdf

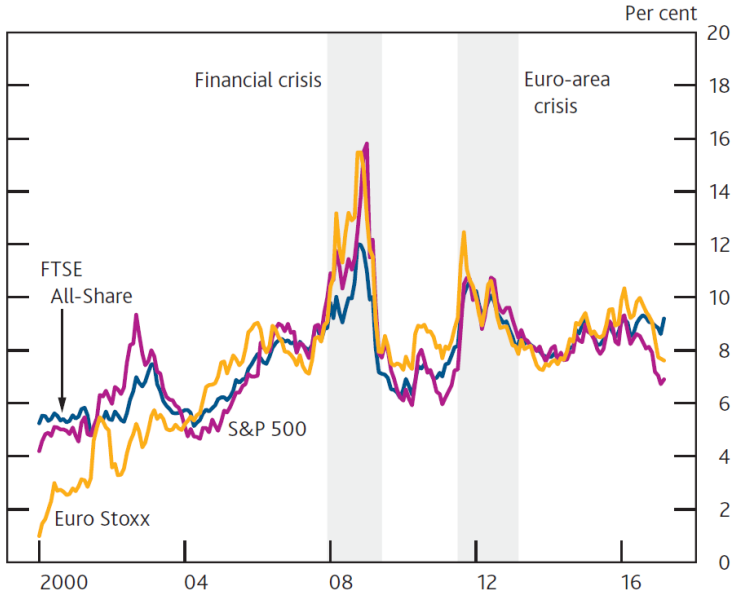
Barclays Equity Guilt Study), survey evidence (Fernandez) as well as forward looking evidence (CEPA's own DGM model, as well PWC's DGM output used to inform Ofwat's initial view on the PR19 allowance).

A TMR approach is consistent with best regulatory practice in the UK, and the view that TMR is more stable over long-term, with offsetting co-movement between the RfR and the ERP parameters. This is because in times of heightened uncertainty, investors drop risky assets (equity) in favour of safer assets (government bonds), leading to increased discount rates (ERPs) on the former, and lower yields on the latter.

- There is substantial financial literature that recognizes the negative relationship between the RfR and ERP, for example:
- The Bank of England, in its August 2016 report noted this in the context of Brexit: "There remains, however, substantial uncertainty about the nature of the UK's future trading arrangement and the implications for competitiveness. This may have increased the risk premium required by investors to hold sterling-denominated assets";[43] This has been illustrated in BoE's Quarterly Bulletin Q2 2017, where it has published latest estimates of the ERP in the UK and other international markets, based on BoE's improved DDM model (see Figure 1 below), which illustrates strong increase in ERPs during periods of volatility in financial markets (e.g. during the GFC).
- A speech given by Martin Taylor, External Member of the Financial Policy Committee, BoE in May 2015 noted this more broadly, arguing that the low interest rate environment had been accompanied by an increase in the ERP, based on BoE analysis of earnings[44] and the RFR over time. Taylor stated: "the post-crisis fall in interest rates has not been accompanied by anything like the same reduction, it appears, in the cost of equity…this rise in the ERP has been working vigorously against the fall in the RFR."[45]
- Research by Stanford economist John Cochrane[46] finds that "expected returns are high in 'bad times' when …people are less willing to hold risks"[47]
- Similarly, Graham and Harvey's empirical study of S&P 500 returns (2015) finds evidence of "a strong positive correlation between market volatility and the long-term risk premium"[48], where market volatility increases in times of crisis and financial market uncertainty. The authors further find that their analysis of ERP and real Treasury Inflation-Protected Securities (TIPS) yields further supports that there is a negative correlation between the two, which is "consistent with the idea that in periods of high uncertainty investors engage in a flight to safety and accept low or negative TIPS yields and …demand a high risk premium for investing in the equity market"[49]

[43] Bank of England (August 2016), Inflation Report August 2016, accessed here: https://www.bankofengland.co.uk/-/media/boe/files/inflation-report/2016/august-2016.pdf
[44] Calculated as the reciprocal of the P/E ratio.
[45] Martin Taylor (2016), Bank of England, Banking in the Tundra, 25 May 2016.
[46] John Cochrane is the author of *Asset Pricing (Princeton University Press),* a textbook in graduate level Asset Pricing courses.
[47] See (2008) Cochrane: Financial Markets and the Real Economy, p.244. Accessed here: http://faculty.chicagobooth.edu/john.cochrane/research/Papers/financial_and_real_proofs_aug_07.pdf
[48] See (2010) Graham and Harvey: The Equity Risk Premium in 2015, p.12. Accessed here: https://faculty.chicagobooth.edu/john.cochrane/research/papers/financial_and_real_proofs_aug_07.pdf
[49] See (2010) Graham and Harvey: The Equity Risk Premium in 2015, p11.

Figure 1: ERP DGM Estimates by the Bank of England (2017)



Source: Bank of England Quarterly Bulletin, Q2 2017: An improved model for understanding equity prices.

Therefore, because of the inverse correlation between the ERP and RfR parameters, these parameters must be calculated over consistent time-frames, to avoid introducing bias in the TMR estimates.

Although the existence of negative correlation between ERP and RfR appears to be recognized by the regulators' consultants, subsequent calculations of the TMR do not appear to acknowledge the relationship in practice. For example, some of the TMR estimates used to inform the TMR range for HSB appear to use inconsistent data sets. In particular, the majority of the DGM estimates at the lower end of the proposed TMR range are comprised of ERP estimates based on exceptionally long historical datasets of 100+ years (DMS, Barclays) coupled with (comparatively) substantially shorter timeframes over which the RFR is calculated (spot or 10-year average). The above could lead to unstable and inherently downward biased TMR estimates, as the unprecedentedly low government bond yields in the last 10 years during the aftermath of the Global Financial Crisis (GFC) are coupled with ERP series averaged over the last 100+ years, where the latter average does not recognize (or give sufficient weight) to the increase in risk premia observed during the GFC.

Separately, the DGM model presented by the Regulator's consultants uses the currently depressed UK GDP growth rates to forecast both short-term and long-term dividend growth, even though around 70% of the All Share Index revenues come from outside of the UK.[50] As a result, the implied ERP estimates based on the Consultant's model(s) are substantially lower than the BoE's ERP estimates shown in Figure 1, which use relevant regional growth forecasts. The nominal TMR based on the Consultant's DGM model(s) is between 7.4 – 7.9%[51], implying an ERP of 6.9 – 7.15% given the assumed nominal RfR range of 0.5 –

[50] Bank of England (2017), Bank of England Quarterly Bulletin, Q2 2017: An improved model for understanding equity prices. https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2017/an-improved-model-for-understanding-equity-prices.pdf?la=en&hash=F0385353B45A130A1AA557165FBEC5E326FD57FB

[51] See CEPA, pg 36-37.

0.75%. By contrast, BoE's latest estimates currently stand at around 9% (2017), and have not been lower than 8% in the last several years (see Figure 1 above).

Finally, the nominal TMR range considered for HSB of 7.5–8.5% is in fact lower than Ofwat's TMR estimate of 8.0 – 8.5%, where the latter has been challenged by different studies.[52]

In summary, elements of the TMR evidence proposed for HSB do not appear to address the negative correlation between the TMR components, but rather are based on inconsistent datasets for ERP and RfR, which leads to downward bias in the TMR estimates.

6.4.2 Construction phase asset beta

Using listed comparators companies is a common approach to determining the systematic risk for an unlisted project or activity, provided that the risk profile of the comparators closely matches the risk profile of the project whose equity return these comparators are intended to proxy.

While the HSB profile remains largely undefined, one notable issue with the proposed asset beta methodology is that it does not appear to attempt any revenue / profit breakdown of the chosen comparators, to establish a link between the range of the risk profile outcomes that could be relevant for the HSB project, and the set of listed comparators used to proxy those risk outcomes.

The proposed comparator set appears to be exceptionally wide, and includes 30 Construction & Engineering companies in the UK—a diversified set of companies that engage in construction activities with inherently different risk profile from the HSB network project, and including:

- Contractors: Construction of commercial, residential buildings; civil engineering (roads, bridges), special construction (plastering, painting, roofing) etc.
- Services: Architectural & quantity surveying activities; wholesale of wood, materials, hardware, plumbing / heating; renting & leasing of equipment etc.
- Products: Manufacturing of construction products and materials (e.g. bricks, tiles, cement, metal structures etc).

A separate, fundamental issue with the proposed selection of comparators is that the construction companies used to inform HSB's asset beta are likely to be undertaking construction activities under contractual arrangements that shield them from cost overrun and delay risk (through for example insurance contracts), such that the cost of insuring against such downside risk is ultimately born by the investors or buyers of the construction service. Therefore, it is unlikely that the chosen construction companies are good proxies for the construction risk that would be borne by NGET, especially absent a detailed assessment of the contractual arrangements and (residual) risk borne by the chosen comparators.

The asset beta during construction appears to be based on the *average* beta of the construction and engineering comparator set, which is likely to mask strong variation across the betas of the individual companies within the set. This variation is likely to be present in the sample given no attempt has been made to narrow down the sample to more closely

[52] Ofwat (July 2017), Delivering Water 2020: consulting on our methodology for the 2019 price review. Accessed here: https://www.ofwat.gov.uk/wp-content/uploads/2017/07/Delivering-Water-2020-Consulting-on-our-PR19-draft-methodology-2.pdf

match the (likely) risk profile of HSB during construction. This means that there is likely a wide confidence interval around the proposed asset beta.

In summary, all of the above points to inherent deficiencies in the asset beta analysis, which suggests that the estimates are not good proxies for the systematic risk of HSB.

6.4.3 Credit rating

The proposed Construction WACC is based on the assumption that the project could achieve comfortable investment grade (blended A/BBB) credit rating during construction. This is important, because while consistent with the general interpretation of the Regulator's financeability duty, there are currently no proposals in the minded-to consultation to ensure that this will be achieved and tested on a standalone basis (see 4.2.1.2 above). The analysis by the Regulator's consultants also lacks assessment whether financeability metrics support this view.

Since the CPM model specification at present does not delineate a clear risk allocation to NGET vs consumers, it is difficult to establish with sufficient degree of confidence that the project would be financeable, and at a comfortable (blended A/BBB) investment grade rating.

It cannot be assumed *a priori* that the project will be financeable at comfortable investment grade rating, although there is strong economic rationale for ensuring that it is the case (see discussion in section 4.2).

Regulatory precedent supports the view that a comfortable investment grade (blended A/BBB) rating is unlikely to be achieved under CPM on stand-alone basis because:

- Other large Capex projects, such as the TTT, have been given BBB financing cost adjustments, while also receiving greater cash advancement (the cost of financing both debt and equity) during construction (along with other provisions through a bespoke regulatory framework) and government support package for various high impact low probability risks; by contrast, HSB will be entitled to only to the CoD during construction, and will not benefit from government backing. It is therefore inconsistent to assume that HSB will be able to achieve the target credit rating without additional risk mitigations.
- The blended A/BBB risk profile for construction appears inconsistent with NGET's own RIIO settlement, which receives a blended A/BBB rating based on a portfolio of assets consisting of both operational assets (i.e. assets with substantially lower risk) as well assets under construction. If NGET's overall RIIO cashflow is rated blended A/BBB, then it is inconsistent to also assume that the HSB project could achieve the same risk profile during the construction phase for HSB, to the extent that the construction phase holds substantially greater risk than the operational phase of this project (and other infrastructure projects in general).

Separately, while the approach of matching the duration of the construction period with the maturity of the cost of debt index is feasible under general project finance principles, it is not clear that the average duration of the indices used for the CoD allowance, on balance, reflects the expected 5-year construction period, because the indices cited do not target constant maturity. Further analysis is needed to establish that the actual indices used are of the correct duration that matches the expected construction phase for HSB.

The two options considered for setting the cost of debt during operations[53] will have significant impact on the bankability and credit rating of the project.

- Option 1, whereby the cost of capital for the operations period is fixed at the project assessment stage is more consistent with project finance. This, however, would normally assume the project raises debt for the full project finance period upfront (to ensure certainty of costs). This is inconsistent with the proposed approach to set cost of debt with a separate benchmark for construction and operations period. On the other hand, the proposed option 2 introduces significant refinancing (and default risks) for the project.
- Option 2 could potentially impose a refinance obligation on the project which can result in sub-optimal outcome for both the consumer and the project.

Finally, gearing during construction assumed under CPM appears low and inconsistent with what would be expected in a project finance setting, where the proportion of debt finance is typically greater from the onset. CEPA assume 37.5% of Capex is financed with debt. Since the operational phase then assumes that c.85% of the project is financed with debt, this implies that a large portion of the initial equity exits immediately after construction (circa two thirds) – a strong assumption which might be unrealistic in this case.

6.5 Operating cost of capital benchmarks

6.5.1 OFTOs as a benchmark

The starting point for the operational CoE for HSB is based on the latest rounds of OFTO CoE benchmarks, which are then adjusted for movements in market parameters (TMR, RfR).

Drawing direct parallels between the OFTO and HSB CPM investment proposition is premature, and in fact the OFTO benchmarks are likely to end up being poor comparators for the following reasons:

- Key features of the investment proposition for HSB during the operational period under CPM remain undefined and therefore cannot be compared to those of OFTO assets – for example, CPM does not have specified availability threshold requirement for HSB, or available Opex risk protection mechanisms (e.g. materiality threshold that will trigger force majeure event);
- Some of the features of the HSB CPM framework entail greater risk for HSB relative to OFTOs, e.g. longer operational period (25 vs 20 years), no clearly defined pass-through costs, and no explicit cap on new Capex requirements which may be needed during operation, and whose regulatory treatment is unspecified beyond the statement that it will reflect “prevailing arrangements in place at the time”.[54] Therefore, the extent of operational risk under HSB is not known at present, and could end up being higher than the operation risk in OFTO projects;
- Observed bid WACCs for competitively tendered assets need to be viewed holistically in conjunction with the investors’ assessment of the project risks and opportunities to maximise revenue streams and expected returns. In particular, winners of OFTO competitions have made strong assumptions around, e.g. tax and terminal value which are reflected in the bid WACCs for those assets;

[53] See footnote to para 4.14 of consultation document.
[54] Minded-to consultation, para 4.32.

- The OFTO regime has undergone several tendering rounds to date and can be considered a mature regime. Through consecutive bidding rounds, investors would have gained experience with managing the risks for OFTOs, as well as understanding of the potential upside, both in terms of technical characteristics of the asset and the regulatory regime governing outperformance potential. By contrast, the proposed framework for HSB is new and untested, which the cost of capital benchmarking does not appear to recognize in full.

6.5.2 Operational phase Cost of Debt

The lower bound on CoD for the operational phase of HSB is based on the assumption that HSB could achieve A rating during operations, on grounds that:

- First, OFTOs could issue with headroom; and
- Second, the consultants' assessment that CPM is lower risk relative to OFTOs. The upper bound for the CoD assessment is based on a blended A/BBB rating, and the CoD includes a forward rate adjustment.

The headroom analysis appears to be incomplete, in that it does not attempt a reconciliation between the OFTO yield and the non-financials corporate A-rated 10yr yield, even though there are differences in the risk profiles of the two. For example, headroom could be explained at least to some extent by e.g. the shorter duration of OFTOs bonds relative to the duration of the index (19 year vs 23 year).

Finally, given the lack of detail in how CPM will be implemented in practice (see above), at present, risk benchmarking of CPM against OFTOs is premature, since important risk factors are not clearly defined for HSB as of yet. Whether the project could achieve an A-rating during operations will crucially depend on the final risk allocation outcome under CPM.

7 Conclusions

This report has provided a detailed discussion of the UK Regulator's minded to position on the delivery model for HSB, which envisages that HSB is delivered via the CPM route, with an associated Cost of Capital as proposed by CEPA, the Regulator's consultants.

7.1 Key findings

As set out, CPM is effectively a new regulatory framework for transmission infrastructure in the UK and marks a significant departure from the RIIO model. The Regulator's stated rationale for exploring a bespoke regime for HSB, as an alternative to the CATO model or SWW under RIIO, is to bring potential benefits of competition to customers where competition itself cannot be implemented.

Ofgem has posed a valid question whether, in the absence of competition, customers could derive benefits similar to those that could be expected under the expected outcome of competition for HSB.

However, customers cannot benefit directly from competition in the absence of actual competition; a regulatory design is not a competitive outcome. That is not to say that in principle, customers might not benefit from an updated regulatory design, especially when new market conditions or market dynamics, which could lead to such benefits, are not captured under the existing regime.

Changes to the regulatory design could objectively aim to capture key drivers that could be expected to create benefits for customers under a competitive regime, such as a low cost of debt, or reduced regulatory discretion due to longer cost allowance visibility. However, it cannot be assumed that copying some of the features of a hypothetical competitive regime, and blending these with a regulatory regime, would automatically ensure the optimal regulatory design.

The specific features of a competitive regime are generally designed to achieve an optimal economic outcome *in the presence of competition*; it cannot be assumed that the same features will achieve an optimal economic outcome *in the absence of competition*. It also cannot be assumed that the HSB project would be deliverable and financeable when features of a competitive regime are imposed on the incumbent.

The overall problem with CPM is, therefore, that it is an outline of a potential regulatory framework that is neither a competitive regime, nor a fully considered and developed bottom-up optimal regulatory framework for the on-balance sheet delivery of HSB by NGET. CPM is based on an assumption that a market design from one world would constitute, by definition, an optimal design in another world, and that this solution would be deliverable and financeable.

It is not clear that in the absence of competition, the current regulatory regime could not, if appropriately re-calibrated, achieve the same or greater benefits to customers as CPM; or whether a different regulatory design for on balance sheet delivery, i.e. different than a direct copy of the features of a hypothetical competitive regime, could not achieve the same or greater benefits.

Design of CPM compared with potential alternatives

From the regulatory and economic perspectives, it does not appear that CPM satisfies key economic criteria that underpin a robust regulatory design that would deliver long-term value for money for customers. The minded-to position does not provide assurance that the

economic principles that underpin a robust regulatory design have been satisfied (or will be satisfied), in the case of CPM.

Specifically, it has not been shown that CPM would ensure that NGET would be able to recover its efficiently incurred costs, including the cost of financing, building and operating HSB; it has also not been shown that HSB is financeable under CPM on a standalone basis, or that the cost of capital allowance is commensurate with the project risk profile.

A failure to ensure that these criteria have been met poses a serious risk that NGET would not be able to deliver and finance HSB on CPM terms without implicit cross-subsidies from other parts of the business. The latter would be economically inefficient and would be also against the essence of CPM as intended, which is to replicate a standalone competitive delivery of HSB.

Overall, CPM does not appear to have been based on a bottom-up derivation of an optimal regulatory regime from a range of possible regulatory frameworks to include features that would maximise benefits for consumers in the case of the on-balance sheet delivery of HSB by NGET. Instead, CPM simply copies key features from the existing market regimes (e.g. OFTOs), regardless of how comparable these are, and assumes that the maximum benefits to customers and economically optimal outcomes would automatically ensue, without providing rational basis for this assumption.

CPM as a reflection of a hypothetical competitive outcome

CPM is intended to mimic the equilibrium market outcome (price, cost, risk allocation), potentially achievable under competitive tendering for construction, financing and operation of HSB taken together. Under a competitive tendering, the final outcome would be driven by market forces, but CPM requires the Regulator to *hypothesise* what the efficient outcome might look like. This is difficult to achieve in practice. In the case of HSB, this problem is exacerbated because this 'hypothesising' has to be undertaken in the absence of any precedents, as there have been no competitively procured projects of similar nature, with the same technology, or regulatory risk as HSB. There have been also no other similar-sized transmission projects with construction risk in the GB market delivered this way, and, in fact, no competitively tendered standalone projects in onshore networks at all.

It would be difficult for anyone under this setup to establish a robust view of what a hypothetical competitive outcome could look like. This poses the risk that, if the parameters of CPM are estimated poorly, either due to deficiencies in analysis, or due to lack of sufficient information, the outcome might not be deliverable in practice.

Value for money (VfM) for customers analysis supporting CPM

In order to justify a new regulatory framework to capture potential additional meaningful benefits to customers without increasing costs, it is important to estimate the likely VfM that could be realised under the new regime compared with best possible alternatives. However, the VfM assessment of CPM, as presented in the minded-to consultation, is limited in scope and does not assess optimal model design options that could increase or reduce efficiency savings and long-term value for consumers.

For example, there is no evidence or analysis to show that, compared with potential alternatives, CPM would ensure that tariffs are profiled (and therefore costs are recovered) in a way that achieves the optimal trade-off for consumers between frontloading the costs over a period shorter than the economic life of the project and ensuring that it is financeable.

The assessment is generally limited in terms of key model design features that are considered and assessed for their ability to deliver efficiency savings, and also in terms of the number and specification of best possible alternatives (counterfactuals). Instead, the VfM focuses on reflecting what are, in effect, pre-assumed savings from financing under CPM compared with only one, stylised counterfactual.

Specificity and details of CPM

The level of detail in the current specification of CPM is also insufficient to price the project with any degree of confidence. The regulatory design underpinning CPM lacks detailed specification of key features that would define the residual risk that a hypothetical investor would be exposed to. Some of the key features that remain unspecified include Capex cost sharing factors, definition of "controllable" vs "uncontrollable" expenses, Opex risk mitigants, availability targets, or the treatment of refinancing.

Any attempt to specify required returns under CPM at present would need to address a wide range of potential risk allocation outcomes and, therefore, would be subject to wide confidence intervals and significant risk premia. Without further specification, it is unlikely any potential bidder for the project would in fact consider the project in the first place. The minded-to consultation and the associated cost of capital estimates do not appear to acknowledge this uncertainty, or link the plausible range of potential acceptable risk allocations with the derived estimates of required returns.

The lack of specification of CPM means that CEPA has been given an impossible task by being asked to develop a market price for a project that is not specified. For that reason alone, CEPA's results are open to challenge.

CPM as a proxy for standalone project finance

To the extent that the proposed high-level design of the regime for the project has been specified, it is inconsistent with typical project finance structures. This risks that the final specification and risk allocation outcome will not be appropriately priced.

On risk allocation, CPM departs from a typical project finance model in that construction risk is not fully specified in terms of the scope of the post-construction review and the risk-sharing rate; the availability targets and levels of penalties have not been set so that availability risks cannot be assessed at present. The counterparty risk under CPM is also higher than for a typical PFI project because NGET is not a government entity and the additional regulatory risks exist in that there is scope for regulatory discretion around e.g. additional and maintenance Capex and final Opex allowance.

The return calculation under CPM departs from how the project rate of return would have been determined by potential bidders because the separate treatment of construction and operational periods is not aligned with the market practice of considering both phases jointly to maximise value.

Moreover, the assumed two-stage debt financing is not aligned with the market practice of arranging debt upfront to avoid refinancing risks; gearing is assumed fixed when it would in fact vary over the contract tenor; and neither financial covenants nor their costs are considered. Assuming different ratings for each phase of the project is also not aligned with a standard rating methodology of assigning one rating over the contract tenor and the financial structure has not been optimised as it would be in the standalone project finance setting.

In principle, CPM could be made to replicate a project finance competitive outcome with a return allowance that appropriately remunerates the cashflow risk of the project consistent with such an outcome, but this would not be consistent with the proposed methodology given all the differences and gaps in structuring and risk allocation as listed above.

Estimation of the required returns on HSB under CPM

Even if the project could be effectively priced (i.e. if the model were to be ultimately correctly specified in full, including adequate definition of risk allocation and other key characteristics), the proposed methodology used for estimating the cost of capital has deficiencies which imply that the allowed return derived under this methodology would not be robust.

When estimating the required rate of return for HSB under CPM, Ofgem's consultants do not sufficiently consider potential market responses to putting HSB for competition—e.g. how

investors would approach financing, what financial structures would be developed in practice, how markets could react to the proposed regime, how the proposed risk allocation would be priced, or what would be the impact of specific project parameters on structuring and financing. All these factors could significantly impact the resulting rates of return and need to be analysed and taken into account.

Instead, the project hurdle rates are estimated by combining two WACCs; one of which is a CAPM-based WACC estimate for the construction period, while the proposed operational phase WACC is based on competitive benchmarks from OFTOs. The latter have been used despite the fact that no clear link can be established between the risk allocation achieved in the OFTO models and the risk allocation (that could be) embedded in the CPM framework.

More generally, the OFTO benchmarks are poor comparators for HSB because they are not sufficiently comparable to assume the same rate of return, even for one phase of the project: OFTOs are multiple, smaller, simpler, mature, competitively tendered projects based on a regulatory regime whose deliverability has been tested in practice over several rounds of tendering. In contrast, HSB, as proposed, is unique, large, complex, new, 'first of a kind' (from a technical, market and regulatory perspectives), not competitively tendered, and based on a proposed regulatory regime, which is not fully specified.

Notwithstanding different risk characteristics of OFTOs and HSB, the analysis in the consultation also ignores the value placed by OFTOs' bidders on elements of the regime such as assumptions around tax outperformance and terminal value. In addition, some CPM features, where specified, already imply greater risk for HSB relative to OFTOs, e.g. longer operational period and no defined pass-through costs.

Bidders for OFTOs compete for 'ready-made', operational, brownfield assets. In contrast, potential bidders for HSB would be asked to bid for a new, greenfield project and would have to deliver and take on the risks of both construction and operational phases (i.e. they could not bid e.g. for the operational phase only). This is likely to attract different types of bidders, with different market appetites, who would rely on different types of financing. Splitting the project into 2 phases is a conceptual exercise rather than a reflection of what investors would bid for up front and there is a risk that considering HSB in this way would distort the reality.

In order to estimate target required returns for HSB in practice, weight would need to be given to market observations for projects that include have similar risk profiles, including construction risk, and structures. There is considerable evidence on the returns from PFI projects which could inform such analysis, but this has not been taken into account.

Observed bid WACCs for competitively tendered assets need to be viewed holistically in conjunction with the investors' assessment of the project risks and opportunities to maximise revenue streams and expected returns.

The analysis of the rates of return by Ofgem's consultants for the construction phase focuses on market parameters under CAPM rather than on the details of financing that would actually result in the market and that would drive required returns. For example, the estimated construction WACC is based on a CAPM approach. CAPM can be applied in a way that is consistent with a competitive outcome, but the current application does not ensure that this is the case.

Specifically, the beta is not based on a relevant set of comparators whose risk profile matches that of the project. Also, no consideration has been made for including appropriate premia for asymmetric risks, which are typically applied in project finance to reflect the return requirements of construction projects with substantial downside risks where these risks have not been taken into account in probability-adjusted projected cash flows (as also required for the application of CAPM). While CAPM can inform the assessment of a lifetime project WACC, it would need to be supplemented to reflect asymmetric downside risks of a single project where assumed allowances (projected cash flows) are not adjusted for such risks.

Given the above, it is unlikely that the estimated construction WACC would be consistent with a competitive outcome.

The returns analysis also makes no meaningful attempt to link the application of the chosen approach to the actual features of CPM as specified, as would be necessarily to derive required returns under a competitive model. This means that the analysis of the likely outturn rate of return on HSB under CPM, as considered by the Regulator, is not robustly determined.

7.2 Implications

The above analysis suggests the following implications going forward:

The optimal regulatory design for delivery of HSB should be considered before attempting to price the project

The proposed outline of a regulatory framework underpinning CPM has not been designed based on a bottom up assessment of key regulatory design features. This means that CPM has not been developed with a view to establishing an incentive-based regulatory mechanism that would deliver maximum efficiency savings and long-term value for consumers assuming on balance sheet delivery by NGET or been considered relative to relevant alternative models for such delivery.

A first step to remedying this problem may be for key stakeholders to consider alternative regulatory options that could be used to deliver HSB on balance sheet by NG. This could take into account the limited timeframe available before the project puts delivery of electricity from HPC at risk.

The development of a robust alternative regulatory design for delivering HSB on balance sheet by NG would entail a considered assessment to define the features of the optimal regulatory framework that would deliver maximum efficiency savings and long-term benefits to consumers. Regardless of whether the alternative regulatory design takes the form of a modified or fully specified CPM model, or an entirely different regulatory model for on balance sheet delivery, any regulatory model that may be chosen in the end, would need to satisfy the key economic criteria that ensure the project is deliverable, financeable, and provides long-term benefits for consumers, namely:

- the model will allow NGET to recover its efficiently and prudently incurred costs for delivering HSB, including an allowance for an appropriate Cost of Capital, which is set at a level that can attract sufficient debt and equity capital;
- the model is financeable on a standalone basis, while also ensuring that customers benefit from the currently low levels of interest rates;
- the model has appropriate cost and output incentives in place, such that it incentivises NG to deliver quality of service at a low cost;
- optimal tariff profiling is ensured such that the project is financeable while customers bear the optimal tariff increase in relation to HSB.

In practice, given the urgency with which a delivery model would have to be put in place before the scheduled date of HPC going online is put at risk, the Regulator and NGET may want to consider alternative, possibly existing regulatory options for delivery of HSB, including possible amendments to the existing RIIO SWW route.

To the extent that a proxy for a competitive model is considered as one of the options in the above, as a starting point it should be based on a more accurate reflection of the likely actual project finance structure that would emerge under competitive tendering

On risk allocation, it is important that any potential competition proxy specification accurately reflects the potential project finance structure that would be used under competitive tendering. For example, at a minimum it would need to specify construction risk allocation, including scope of the post-construction review, risk-sharing rate on cost overruns, as well as other factors such as availability targets, and levels of penalties in the case of breaches, all of which impact the visibility of cashflows and the required return under project finance.

Any pricing of the project has to be done once detailed specification of risk has been developed

Regardless of whether the Regulator chooses to implement a model similar in overall design to CPM or an entirely different regulatory framework, the details of the regulatory framework would have to be fully specified before a meaningful attempt at pricing the residual risk of the project can be made.

This means that any regulatory model for delivery of HSB would have to have a clearly delineated risk allocation to key stakeholders – including investors (NG) and consumers – before attempting to derive robust cost of capital estimates for the project.

If the CAPM framework is used, it has to be supplemented to ensure full project risk is priced

If appropriately calibrated, the CAPM model can be used as a baseline cost of capital benchmark for assessing the appropriate Cost of Equity capital for HSB, subject to appropriate choice of risk comparator benchmarks and market parameters that appropriately reflect current market conditions.

However, CAPM is insufficient as a standalone model for pricing equity risk, for projects with substantial downside risk such as HSB. The model requires all downside outcomes and potential losses to be incorporated in the project specific cashflows before the premium for risk (i.e. variance of returns around expected cashflows) is determined. If the assumed cashflows e.g. based on the allowed revenues, are not adjusted for such downside events, as appropriate, the CAPM-derived required returns have to be adjusted. Therefore, any future arrangement would need to account for this issue, by reflecting appropriate premia for downside scenarios. It might be also necessary to account for asymmetric distribution of risk, consistent with UK regulatory precedent.

Cost of Capital benchmarks from other projects should account for differences in technological and regulatory risk

Finally, consideration of competitive cost of capital benchmarks (e.g. from PFIs), or any other cost of capital benchmarking (e.g. from UK or International regulatory precedent), should be preceded by a comprehensive relative risk benchmarking exercise in order for those comparisons to be meaningful.

Project cost of capital benchmarks will differ in terms of both project / technological risk as well as risk inherent in the regulatory regime. Drawing parallels between the HSB project and other benchmarks would need to address this challenge.

It should also take into account in full the potential costs and risks associated with such models.