KPMG

National Grid Electricity System Operator

Independent report on the ESO business, financeability and price control approach

5 July 2019

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Executive summary

The overarching objective of regulation is to simulate outcomes that would occur in a competitive market for the provision of regulated activities, which will ensure economic efficiency and maximise value to customers while securing financeability and hence delivery of regulated services. This report considers the appropriate regulatory framework for the ESO to meet these objectives.

The report sets out how an appropriate regulatory approach for National Grid's Electricity System Operator (ESO) could be developed based on a holistic analysis of ESO's constituent business activities, risks, obligations, performance and financing requirements, and their implications for financeability and potential for creating value add for consumers.

We consider a regulatory design that would be expected to create conditions that best approximate what a commercial market investor would be willing to accept to provide all constituent ESO services in a competitive market setting on a standalone (no subsidy) basis.

If a regulatory approach is not considered on this basis, there is a risk that it will set mechanisms that fail to ensure economically efficient outcomes for ESO's customers and will not meet the criteria for the best regulatory practice.

The analysis in this report concludes that the most appropriate model for the ESO is likely to be a hybrid of RAV*WACC with margins on both internal and external costs.

The objective of economic regulation is to simulate efficient economic outcomes that would result from a competitive market for the provision of regulated activities. Some recent proposals for ESO's regulation appear to be moving away from approximating competitive market outcomes for all ESO's business activities, and towards an approach based to a greater extent on pass-through costs akin to the budgeting of public provision of services. Neither the economic theory nor regulatory best practice supports such an approach.

Ofgem's primary duty is to protect the interests of consumers, and seek to maximise value for customers while ensuring that ESO services can be financed and delivered without economically inefficient cross subsidies. Recent proposals risk losing the anchor of approximating the terms consistent with economically efficient, market-delivered provision of SO services, and the balance between the transfer of risks and responsibilities on the one hand, and the required remuneration and financeability for services to be provided on commercial basis on the other hand.

This independent report:

— examines business and risk characteristics of ESO's constituent activities as well as that of the ESO overall;

— describes examples of different market participants that provide similar business services in competitive markets; and

— sets out how these activities should be remunerated to ensure efficient market outcomes based on relevant market benchmarks, on a commercial basis.

These criteria imply that a holistic, comprehensive assessment of the characteristics of constituent business activities and risks of the ESO is necessary to inform the design of the regulatory framework. This ensures that the nature of the regulated activities will be appropriately reflected in the regulatory regime.

The assessment of the terms on which ESO's regulated activities would be provided in a competitive market can be also informed by considering business comparators for the ESO. There are a few, if any, businesses that conduct sufficiently similar activities to constitute an appropriate benchmark for the ESO as a whole, but relevant market benchmarks can be found for each of the ESO's constituent business activities.

The report considers 3 core business activities of the ESO*: (1) the real-time balancing function, (2) the future systems function and (3) the collection agent function.*

The three business activities are considered separately since they are distinct and separable from each other, have considerably different risk profiles and business characteristics, and are analogous to quite different comparator sets, meaning the investor perception of the activities is also quite different. For completeness, and because financing is carried out at a business rather than activity level, the report also considers the ESO as a whole.

This report is structured by considering the business nature, key business risks, financing requirements and financeability criteria for each business activity and the ESO as a whole. An appropriate regulatory approach for each activity is then derived based on the above according to three main criteria:

— Reflects business characteristics and key risks;

— Simulates economically efficient market outcomes; and

— Ensures financeability from an investor's perspective.

The report sets out key elements of the regulatory regime for the ESO implied by the analysis of the factors set out above and estimates indicative parameters of the proposed regulatory approach at a high level. These parameters need to be carefully calibrated in due course subject to the overall regime design.

The report also compares this approach with the one currently set out in the Ofgem consultation, and considers, at a high level, the financeability of the ESO on the basis of different options outlined in Ofgem's consultation.

Real-time Balancing Function

The real-time balancing function is analogous to the activities of a *securities exchange* as it creates and manages an active market and undertakes market-making activities to ensure balancing (liquidity), similar to a multilateral exchange with continuous trading. A stock exchange provides one possible benchmark with similar risks and critical importance of its services for the economy; other exchanges and markets provide a wider comparator set. There are in fact examples in Europe of exchanges taking on some of the roles and responsibilities of electricity SOs.

A regulatory regime based on a margin linked to the scale of the market size is likely best to approximate the remuneration that would be required by a commercial investor to undertake on ESO's activities in this regard, given the prominence of risks associated with continuous system operation, quality of service and potential for market failure. These risks are likely to scale with the magnitude of the market.

The appropriate financeability tests for such activities are linked to market pricing (a margin on its services), as well as capital-based metrics, such as those used to evaluate the financial health of asset-based utilities (including leverage and interest cover) given the requirement for investments in capital assets as well as in skills.

A regulatory regime based on a hybrid model of RAV*WACC plus a margin on forecast internal costs is the appropriate approach to reflect required capital investments as well as operational and commercial risks approximating market outcomes for such services. This approach meets the requirements of the capital based and profitability metrics, which are used in competitive markets for the provision of similar services.

Future Systems Function

The future systems function is analogous to a *professional services business* with specialised knowledge and skills. In particular, technical consultancies and specialised service provider firms provide a suitable comparator set. UK-domiciled, specialised professional services companies provide a useful benchmark for the future systems function.

The key business characteristics of this function include the importance of human capital, output quality risks, and intangible assets.

Credit rating agencies focus on the level and stability of Earnings before Interests and Taxes (EBIT) margins when assessing credit quality of similar asset-light businesses. Liquidity metrics for these businesses include debtors days, bad debt as a percentage of revenue, and other measures pertaining to receivables. Risk exposure based on historic cash outflows and/or value-at-risk modelling are important financeability considerations in this context due to the possibility of high-impact adverse events.

In practice, in order to meet a commercial investor's requirement of expected level of EBIT margin to undertake these activities, the appropriate regulatory regime can be based on a margin on forecast operating costs, given the reliance on the skills and expertise of the ESO's employees.

Collection Agent Function

The collection agent business function is analogous to a medium-size, *focused financial institution*, which manages a dynamic balance sheet with continuous churn of receivables and liabilities resulting from large, difficult to predict and volatile financial flows. This business function faces risks similar to organisations providing other specialised financial services, including operational and IT risks, ensuring efficient financing, and dynamic balance sheet management.

Benchmarks for this type of activity include balance sheet and cash management or credit card services or securitisations with 'breathing' structures. Investors and regulators of these businesses use a number of metrics when evaluating their financial health, including solvency, liquidity ratios and tests of risk exposure, which are relevant for assessing their financeability.

As the scale of the risk and the revenue requirements are inherently linked to the volumes and volatility of the cashflows being managed, and given the pricing methodologies that exist in similar markets as set out above, a margin applied to forecast TNUoS (Transmission Network Use of System) and BSUoS (Balancing Services Use of System) charges is likely best to approximate remuneration for these activities that would be required by a commercial investor in a competitive setting.

ESO business as a whole

The combined ESO is an amalgamation of three different business activities that function together for the benefit of operating the system as a whole. The ESO is an asset-light organisation at the heart of the energy system that plays a fundamental role in facilitating whole system outcomes. The risks and requirements for value add from the ESO are increasing given the challenge of energy sector transition.

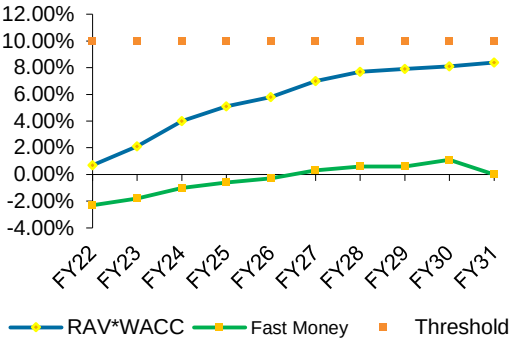
The ESO is a complex, multi-faceted business. This means that a robust regulatory approach has to be appropriately tailored to the specific business characteristics of its constituent activities and its responsibilities for the system as a whole. The risks to which each of the three functions are exposed are all relevant to the combined ESO business, and for the corresponding financeability considerations and the design of the regulatory regime.

A broad range of financeability metrics is relevant to the ESO. This is consistent with the complex nature of the ESO business model. In particular, the regulatory approach for the ESO should link remuneration to a number of underlying business drivers corresponding to key risks for the ESO or appropriate proxies. This implies a return on capital assets invested in the RAV; a margin on the funds collected and dispersed by the ESO in respect of TNUoS and BSUoS charges on behalf of system users; and a margin on the ESO's forecast internal costs.

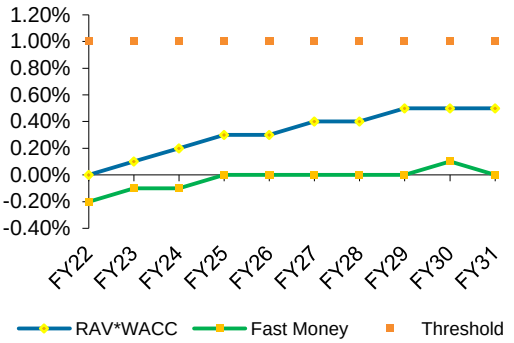
The analysis and considerations outlined above also imply that neither of the two models recently suggested by Ofgem—RAV*WACC or all fast money—are aligned with what a commercial investor would require in order to take on and finance ESO's activities in a competitive market setting. This leads to the conclusion that these proposed approaches do not meet the criteria for simulating competitive market outcomes and would not ensue economic efficiency or maximise value to consumers.

A high level analysis of the financial projections of the ESO under these approaches also suggests that the ESO business is unlikely to meet the thresholds of a number of key financeability metrics. This is shown in the graphs on the right.

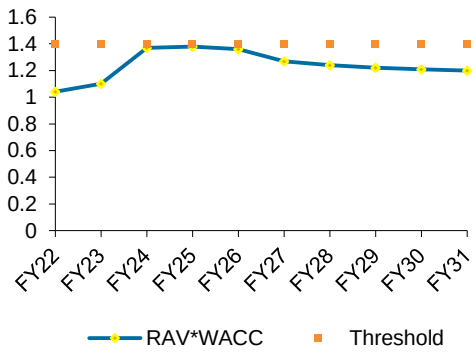
The funding models proposed in the most recent consultation are therefore not appropriate for the characteristics of the ESO and would likely lead to sub-optimal outcomes. Instead, the analysis outlined in this report suggests that the appropriate funding model for the ESO combines a RAV*WACC approach with margins on forecast internal operating costs and external cashflows.



EBIT margins on controllable revenue



EBIT margins on total revenue



Adjusted interest cover ratio

The thresholds illustrated for the EBIT margin on controllable revenue and AICR are taken from Moody's credit rating methodologies for logistics (asset-light in nature) and network utilities as proxies for the ESO given that sector-specific methodologies are not available. The threshold for EBIT margin for total revenue is derived from previous cost pass-through benchmark that KPMG produced for SONI. It cannot be inferred that these are the actual thresholds for the ESO though it should be noted that given the characteristics of these businesses the thresholds could be even higher.

01 Introduction, objectives and overall approach

Under the RIIO-T1 price control approach, the internal costs of the Electricity System Operator for Great Britain ("ESO") are funded via the National Grid Electricity Transmission ("NGET") RIIO-T1 price control. This places general obligations on the ESO, along with NGET, to deliver certain outputs (for example around consumer satisfaction).

In April 2019, the ESO was legally separated from the electricity Transmission Owner ("TO"). This followed a tripartite agreement between the Government, Ofgem and National Grid in response to the Government's policy of introducing greater independence of the privately-owned and for profit system operator to allow it to take on enhanced roles in respect of Electricity Market Reform (EMR) and the Integrated Transmission Planning and Regulation (ITPR) project.

Last year, Ofgem consulted on the bespoke regulatory approach that will apply to the ESO under the RIIO2 price controls. In December 2018, Ofgem consulted on the design of the ESO price control.

This consultation set out proposals for ESO allowances to be determined on an activity-by-activity basis, categorised by risk, allowing for different remuneration levels to be set based on the activity area in question. This broadly followed the recent CMA precedent for the development of the SO remuneration model and built on it.

In its May 2019 RIIO Methodology document, Ofgem set out different proposals, with some alternative approaches to setting allowances.

These proposals appear to be moving away from approximating competitive market outcomes by business activity, and towards an approach based to a far greater extent on pass-through costs akin to public provision of services.

In searching for a better value for consumers, Ofgem's proposals appear to risk losing the anchor of approximating economically efficient and market-delivered provision of SO services, and hence also the balance between the transfer of risks and responsibilities on the one hand, and the required remuneration and financeability that would be required for services to be provided on commercial basis on the other hand.

Ofgem has indicated its intention to consult further with stakeholders before confirming all aspects of the funding model and incentives design for the ESO, suggesting that it is continuing to consider the appropriate approach. This document is intended to inform Ofgem's considerations as it progresses towards its final decision on the approach.

The nature and functions of the ESO are unique within Great Britain ("GB"), and there are few examples of system operators outside GB that function as separate entities. Non-GB system operators are generally either integrated with the TO, or operated by the public sector. This means that it is not straightforward to directly benchmark the activities of the ESO as a basis for setting the price control approach while ensuring financeability.

Key exceptions to this are the business models and regulatory approaches applicable to the ESOs in Northern Ireland (the System Operator for Northern Ireland ("SONI")) and the Republic of Ireland (EirGrid), which are similar to the GB ESO in a number of respects. SONI and EirGrid—like the GB ESO—operate separately from the TO and are subject to maximum allowed revenues set by the respective regulators for each jurisdiction (the Commission for Regulated Utilities and the Northern Ireland Authority for Utility Regulation).

These precedents therefore provide useful insights for the development of the regulatory approach for the GB ESO. For example, the approach for remuneration of SONI and EirGrid are both multi-dimensional, including both a return on the RAV and margins applied to various cost categories.

These approaches were both developed following extensive consideration of the ESO business models and detailed analysis of the risks faced by each entity. SONI appealed the most recent price control determination by the UR to the Competition and Markets Authority ("CMA") in 2017, following which the CMA undertook an extensive, root-and-branch review of the regulatory approach for SONI. The findings from this review are particularly insightful in the current context.

At the same time, there are a number of differences between GB ESO and its counterparts in Northern Ireland and the Republic of Ireland. In particular, the ESO is substantially larger and operates a much more complex system than either SONI or EirGrid. Also, SONI undertakes a "thicker" set of activities than the GB ESO, including transmission network pre-construction activities that warrant a different treatment under its revenue determination.

Objectives

This report examines the business activities undertaken by the ESO and sets out how these activities should be remunerated to ensure efficient market outcomes based on relevant market benchmarks, on a commercial basis.

This report is based on the fundamental economic principle that regulation should simulate efficient, competitive market outcomes.

The purpose of regulation cannot be to force a private agent, funded by private capital, taking on business risks and responsibilities, to operate in a way that would not be acceptable, deliverable and financeable in an efficient, competitive market on a standalone basis or to deliver 'not for profit' activities. A regulatory regime which departs from competitive market benchmarks will itself create market inefficiencies, with the potential for unintended, perverse consequences to the detriment of consumers.

The expectation of earning a profit for producing certain outputs represents the firm's *cost* (including the cost of taking on all associated risks and remunerating all forms of capital, including financial and human capital) of undertaking the value-generating activities. It also incentivises it to continue to enhance outcomes for consumers. In a competitive market, the firm is either able to earn a sufficient profit to incentivise it to continue undertaking its value-generating activities - the normal profit - or, where it is unable to do so, it will exit the market and redeploy its resources elsewhere.

In the context of the ESO, the absence of a normal profit would undermine the business's ability to attract the financial and human capital necessary to perform its functions.

The objective of the regulatory regime is not simply to design a mechanism for the reimbursement of costs that would be akin to budgeting for a public agency. The treatment of the ESO's cost base is only one element of the overall regime. Of critical relevance and importance is to consider what is the most efficient, required remuneration that an independent commercial investor would accept to take on the risks and responsibilities of the ESO. This includes consideration of the operation and management of the electricity system and all its constituent functions including performance, delivery and operations of its functions on a day-to-day basis.

If the ESO discharges its responsibilities in a suboptimal manner, the consequences for users of the electricity system are far in excess of its own costs or scale of operations. It is also unrealistic to expect that the ESO would not be exposed to these consequences financially– for example, through litigation or regulatory/public action.

No private entity would be willing to undertake the ESO's business activities and be exposed to the risks outlined above without an adequate, efficient market-based remuneration, regardless of whether or not it was assured of recovery of (some) of its costs.

To inform the development of an appropriate financeability and remuneration approach for the ESO in light of the above, this report conducts a detailed assessment of each of the business activities that it undertakes.

The ESO is a complex business that undertakes a number of market activities, each with their own business and risk characteristics, and different financing requirements; these activities are also inter-related and together constitute its remit.

For each activity undertaken by the ESO, the business and risk characteristics are examined and examples are identified of companies that carry out similar activities in competitive markets that can be used as indicative benchmarks. This is critical, as the relevant criterion for the design of the regulatory regime is whether it creates what best approximates the terms that a commercial market investor would be willing to accept to provide the relevant services.

Based on this assessment, consideration is given to the financing requirements of a business undertaking the activity on a standalone basis, and hence how the financeability of such a business can be assessed and ensured. The appropriate regulatory approach for each activity is then considered based on a number of criteria, summarised below.

The appropriate regulatory approach to ensure feasibility of efficient commercial delivery and financeability on a standalone basis (i.e. without cross-subsidies) for the combined ESO business is then built up based on the corresponding approaches for each individual business activity.

It should be noted that this report does not seek to determine with precision the specific level of remuneration for each activity, or for the ESO business as a whole. Where benchmark returns are provided, these are indicative only and a detailed calibration exercise should be carried out separately to this report to ascertain the exact level of remuneration.

ESO business activities

The business activities of the ESO can be considered in terms of three core constituent components and the ESO as a whole. These groups have been defined based on the boundaries of separable, coherent market functions performed by the ESO that can be clearly delineated and compared to standalone comparators operating in competitive markets. These activities are summarised below:

— **Real-time balancing function—**this function provides services of the real-time operation of the transmission network, ensuring that all reasonable demands for electricity are met within certain operational parameters. This business activity involves the operation of a technological platform alongside procuring and delivering various services to support the operation of the system. The real-time balancing function is assessed in Section 2.

— **Future systems function—**this function provides long-term forecasts for the energy network sector as a whole and high quality real-time data for market players. It has been described as the 'controlling mind' of the energy system. In addition, this part of the company captures the role of the ESO in administering the allocation of Contracts for Difference ("CfDs") and its future role in facilitating competitive tendering for the energy networks. The future systems function is assessed in Section 3.

— **Collection agent function—**this is a function of collecting, managing and disbursing large financial flows (of the order of £4bn per annum) on behalf of electricity system users. The ESO delivers these services in relation to two main types of cashflow: Transmission Network Use of System ("TNUoS") charges and Balancing Use of System ("BSUoS") charges. The collection agent function is assessed in Section 4.

The combined ESO, taking into account all of the individual functions described above is assessed in Section 5.

Criteria for determining the appropriate regulatory approach

In order to derive an appropriate regulatory approach for the ESO in light of its business characteristics and financing requirements, a number of criteria have been developed to reflect the principles of regulatory and financial economics, corporate finance, and corporate financial management in the UK regulated utilities sector.

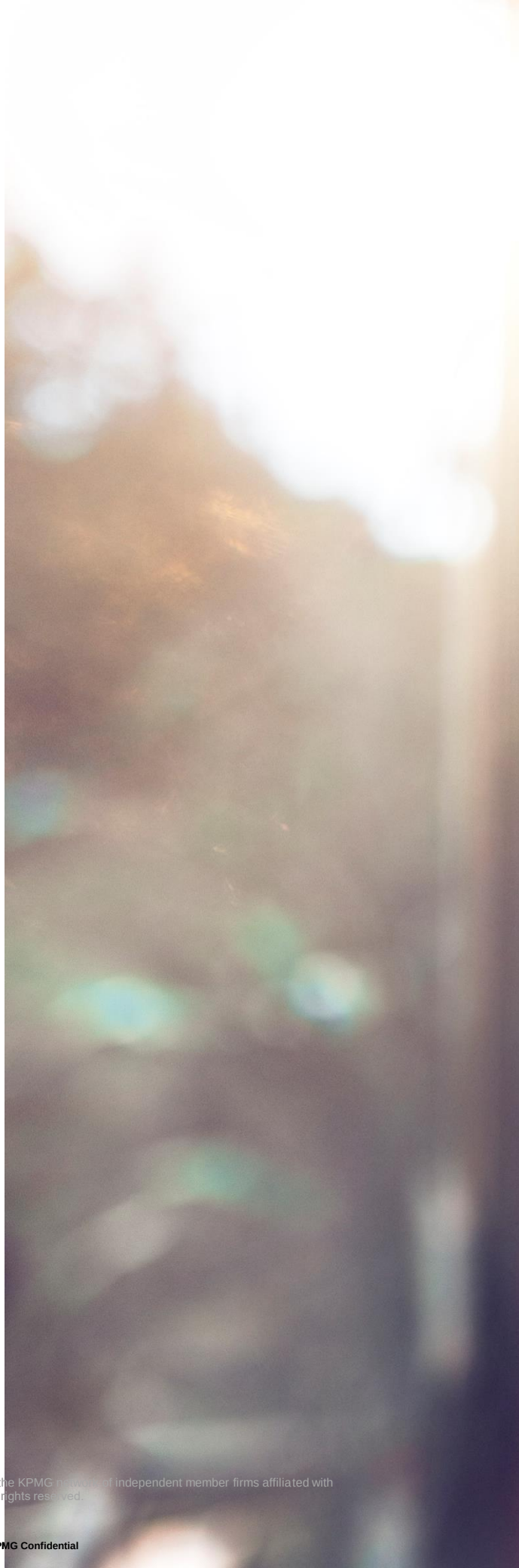
These criteria align with regulatory best practice in general, taking into account the main principles of economic regulation such as proportionality, accountability, consistency, transparency and targeting. Specifically, a regulatory approach should:

— **Be reflective of risk and business characteristics** of the regulated company to ensure that risks can be managed and allocated appropriately;

— **Simulate economically efficient market outcomes** that would be expected in a competitive market environment by incentivising a firm to focus effort and resources where they add most value; and

— **Ensure financeability** by, among other factors, providing adequate financial resources consistent with the risk exposure of the business and the terms on which a commercial investor would be willing to commit capital to the business on standalone basis.

The application of these criteria can be subjective and, to some extent, involve an element of judgement taking into account the circumstances of the regulated entity under consideration, but this cannot change the fundamental principles of simulating efficient market delivery as the overall objective. This report aims to do so as robustly and objectively as possible for each activity and for the ESO business as a whole.



02 Real-time balancing function

This section discusses business characteristics, risks and financing requirements of the real-time system balancing business, and their implications for deriving the appropriate, targeted regulatory regime that can effectively approximate an efficient, competitive market outcome for the provision of these services. It draws a comparison between the real-time balancing function and a *securities exchange* that also undertakes market-making activities as an appropriate, intuitive business comparator, which can be observed in competitive market.

The ESO is responsible for ensuring that all reasonable demands for electricity are met by dispatching generation to meet demand in real time. The real-time balancing function operates within tightly defined operational requirements such as voltage and frequency. The balancing costs are unpredictable in nature due to unforeseen outages and difficulty in forecasting the weather and these costs are not borne by the ESO, though it does have a degree of control over them. The services that the ESO provides within the real-time balancing function include:

- **Frequency response services** relate to maintaining system frequency at 50Hz plus or minus 1%. The ESO ensures there is sufficient generation and demand held in readiness to manage circumstances that lead to frequency variations;
- **Reserve services** relates to additional sources of power in the form of generation or demand reduction to manage demand when it is significantly different than forecasts. Reserve services includes fast reserves, short term operating reserve, demand turn up, super Stable Export Limit (SEL) and Balancing Mechanisms start up;
- **System security services** involve a number of techniques and services which help to maintain the quality and security of electricity supply. The system services that the ESO undertakes can be categorised into three techniques: (1) buying or selling electricity in the balancing mechanism; (2) buying or selling electricity through trading; (3) and entering into contracts for balancing services;
- **Trading reactive power services** involve trades with the market including trading power exchange contracts, forward energy trades and balancing contracts in advance of the balancing mechanism;
- **Reactive power services** that the ESO provides in real-time balancing of the grid involve directing generators or other asset owners to either absorb or generate reactive power to manage voltage levels; and
- **Demand side response ("DSR")** market is facilitated by the ESO to help soften peaks in demand and fill the troughs.

These business activities are characterised by highly bespoke IT infrastructure, analytical tools and communication networks. They are also reliant on highly specialised staff who are typically control centre engineers and data analysts.

Competitive market comparators to real-time balancing

The activities associated with the business of real-time balancing of the grid are in many ways analogous to the activities of a securities exchange which also undertakes market-making activities.

The key competitive market benchmark for the real-time balancing activity used in this assessment is that of a securities exchange combined with a market-maker.

- **A securities exchange** is a facility where trader and stock brokers can sell and buy securities such as shares of stock, bonds and other financial instruments.
- **A market-maker** is a person or organisation that quotes both the buy and sell price of a security aiming to profit on the bid-offer spread. Market makers help to ensure that there is enough liquidity in the market to ensure trades can be completed seamlessly. They take short or long positions, therefore assuming some risk for a profit.

The comparison of the real-time balancing function to a securities exchange with market-making is premised upon a number of key similarities between these entities' respective business models, which are outlined below.

Both the ESO and securities exchanges actively transact with purchasers and vendors of a commodity or asset – i.e., they facilitate multi-lateral trades. This differs from facilitating bilateral trades whereby an entity assumes a passive role in enabling two parties to transact without directly assuming a position or taking on exposure to the trade itself. In the case of the ESO the relevant commodity is the balancing services procured on behalf of consumers. The ESO acts as a counterparty to numerous providers of services that facilitate the balancing of the system in a similar manner to how a market-maker will transact with vendors of securities. The ESO then acts as the counterparty to the opposing trade by transacting with parties that are out of balance, which has a similar effect to a market-maker "closing" its position and eliminating residual exposure to the trades.

The purpose of market-makers is to ensure the market is operating and that transactions are occurring promptly. The prices they set match market supply and demand and they are obligated to buy and sell at the price and size they have quoted. Both entities must ensure that trades in their respective markets take place continuously: the securities exchange, because it is demanded by market participants, who are able to choose other exchanges on which to list securities if they are dissatisfied with the granularity of trading; and the ESO, because its statutory and regulatory obligations demand that the electricity system is continually balanced.

There are significant consequences of system failure for market participants and the broader economy if either entity suffers a system failure. In the case of the ESO, system failures can be extremely costly to the public. For example, the ESO incurs black start costs in the event of a blackout. Securities exchanges can incur large losses if the trading system fails. Both the ESO and securities exchanges are highly regulated business and are viewed as critical national infrastructure.

Like a securities exchange, the ESO is a for-profit exchange providing a facility for generators and suppliers to buy and sell energy. It creates and operates a continuous market with trading, but does not participate in it. It ensures that the market continues to operate. In the case of the ESO, system failures can be extremely costly to the public.

As well as managing the platform that the energy market operates on, the ESO buys and sells the services to ensure that supply matches demand. Market makers undertake a similar role by essentially acting as wholesalers in buying and selling securities to clear the market. The prices they set are the prices that clear the market. The purpose of market-makers is to ensure that liquidity in the market is sustained through continuous market operations and prompt transactions.

The types and quantum of the risks that the ESO and market-makers are exposed to are broadly comparable. A key difference in risk exposure is that market-makers are also exposed to risks in relation to competition which suggests downwards pressure on the margins market-makers are able to earn.

Securities exchanges such as the New York Stock Exchange, Deutsche Börse Group and the London Stock Exchange Group (LSEG), while different in scale and focus, are relevant comparators for the ESO conceptually for a number of reasons that are outlined below. In addition, the Hellenic Stock Exchange is currently going through a process to be authorised as market operator for the management of Energy Financial Markets and clearance of the transactions of the Energy Financial Markets. The Cyprus Stock Exchange has written a proposal to take on the electricity market operator role in Cyprus. In this report, the LSEG is used as an example.

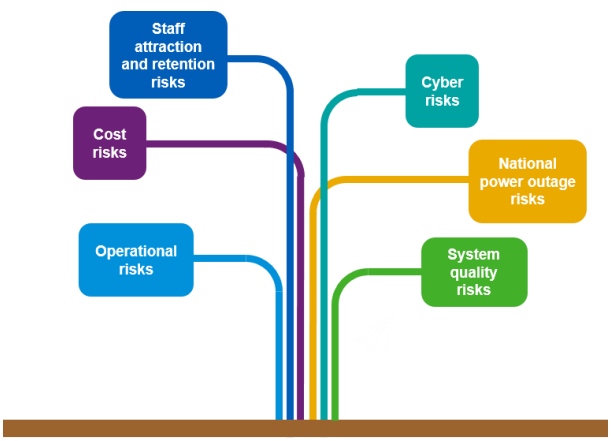
Key risks associated with real-time balancing function

This section presents the key risks that the real-time balancing business of the ESO is exposed to. It also goes on to discuss how the risks associated with this business correspond to those of competitive market comparators such as securities exchanges and market-makers.

The ESO takes the responsibility for all market operations and all the risks associated with providing the market service. The ESO has to ensure continuous operations of the real-time balancing function to ensure that supply is balanced with demand to an acceptable level. There are myriad of risks associated with this business activity which are comparable with the risks that securities exchanges and market-makers are exposed to.

The real-time balancing business is exposed to the following key risks:

- **Staff attraction and retention risks** are vital for the ESO as it relies heavily on highly-skilled and experienced specialists. The ESO's ability to attract and retain key personnel is dependent on a number of key factors. These include prevailing market conditions, organisational culture, brand reputation and compensation packages offered by comparable industries. If the ESO is not able to attract and retain talent it may adversely affect the ESO's ability to balance the grid to the high standards required leading to difficulties achieving targeted outcomes and long-term resilience.
- **Cyber risks** are increasing in likelihood and sophistication. A wide spectrum of actors at levels from individuals to states may seek to interfere with or cause disruption to the electricity system controls. The impact of a successful attack could range from being locked out of key systems or datasets (e.g. ransomware) to full shut down of the system and the corresponding power outage.
- **Cost risks** relating to the operational and capital expenditure associated with running the system. Given the specialist nature of both the employees and the IT infrastructure, in turn leading to a lack of liquidity in terms of supply of goods and services, there is a risk that the costs of running the business are higher than expected.
- **Legal risks** resulting in litigation and financial and/or reputational loss as a result of failing to comply with licence conditions, regulation or legislation either wilfully or inadvertently. This is most likely to be in the form of a data breach.
- **National power outage risks** (which are critical from the public interest perspective) that arise from system or operational errors. A national power outage is one of the highest rated risks in the National Risk Register. The economic and social impacts to GB would be significant. This risk can be considered a high impact low probability event. The most likely causes of such an event are technical failure, terrorism or the malfunction of automated safety systems. The National Risk Assessment considers that there is a medium likelihood (between 0.5 and 5%) chance of it occurring in the next 5 years.[1] A black start process could take between 5 and 7 days to restore power to the entire network. This would have significant costs for the ESO and the GB economy and would lead to material reputational damage for the ESO.
- **Operational risks** include the need to keep within the defined frequency and voltage parameters. The real-time balancing business is exposed to operational risks of not being able to meet the minimum requirements due to either system failure or human error. As such, the business is exposed to potential regulation penalty and legal actions from regulators and end users.
- **System quality risks** relate to the potential risk that the bespoke operational systems required for balancing the network are erroneously designed and/or implemented. The ESO needs to ensure that the systems that underpin the balancing of the grid are robust, secure and stable with high levels of availability. There is a risk that the bespoke operational systems are fundamentally flawed, infeasible, unstable or inefficient. This poor design is likely to manifest into functional defects or system failure which may impact the balancing of the grid and result in key parameters not being met. There are large associated costs with having to redesign the system or costs associated with correcting the erroneous design. In addition the ESO is exposed to financial and reputational risks from litigation associated with the impacts of system failure due to poor system design.



Real-time balancing function risks

[1] *UKPN (2017) Owner / Operator Forum*

Financeability considerations of the real-time balancing function

This section considers what the financing considerations of debt and equity providers would be for a standalone business with the characteristics and risks of the real-time balancing function.

The financing requirements of the ESO real-time market balancing function are similar to those of a securities exchange or market-maker. Like securities exchanges, the ESO needs to invest in a certain quantum of fixed assets such as premises, software and IT equipment. These assets can be tangible (e.g., IT equipment) or intangible (e.g., software, licenses etc.) and will have useful lives of intermediate length, which are shorter than network utilities.

To fund investments to procure and maintain these assets, the ESO will need to obtain financing of corresponding maturity. For example, entities like securities exchanges also issue some intermediate-term debt in the form of bonds to fund fixed assets.

The risks associated with system failures, system quality variations and the general operation of the business create potential cash outflows for which the ESO must have adequate capital available:

— System quality variations could require the ESO to take action to rectify adverse outcomes for consumers or require ongoing IT support, which could involve incurring costs. This is analogous to the securities exchanges technology failures potentially impacting the running of markets and leading to reduced trading or clearing volumes;

— System failure could result in the ESO incurring significant costs for a number of reasons. Firstly, the ESO would need to take immediate action to remedy any failure, which could involve incurring significant costs. Secondly, system failures could potentially expose the ESO to the costs incurred by system users as a consequence of the system failure – e.g., through litigation or government/regulatory action. This is analogous to the exposure of securities exchanges to their own system failures, which would likely lead to similar potential costs associated with litigation and/or regulatory action.

Finally, the ESO must have access to sufficient working capital to cover variations in cost associated with business-as-usual operations.

These financing requirements suggest that the following metrics are likely to be considered by investors when appraising a business conducting balancing activities. Firstly, they are likely to consider capital-based metrics such as those used to evaluate the financial health of network utilities. Businesses engaged in balancing activities may fund tangible capital requirements using debt, and as such measures of leverage, interest cover and debt service cover are likely to be relevant.

The application of capital-based metrics will, however, not be sufficient to ascertain whether the business will have sufficient capital resources with which to manage risks associated with system quality and failure. This is because these risks are likely to be unrelated to the scale of the business's fixed assets. Debt servicing is only a small proportion of the ESO's activity. Investors of asset-light businesses such as consumer services and telecommunications, use different metrics to assess the business. Their key concern is not only about the business' ability to service debt. It is about whether the business' performance, which is reflected in its profitability.

Therefore, measures of profitability based on EBIT or operating margins are relevant in this context, since the risks associated with system quality and failure are likely to scale with the magnitude of the company's operating costs. Margins represent a measure of the financial headroom available to the company (over and above its operating costs) to manage and respond to risks and exposures required by an efficient, commercial investor to undertake these activities. The level of the margin could be based on relevant benchmarks.

Investors in such businesses would also seek to understand the scale of exposures associated with system failures and test how the above metrics would evolve in the context of a failure event. They would also consider whether the company had access to sufficient capital resources in these scenarios.

Implications for the design of the regulatory approach

This section sets out how an appropriate regulatory approach simulating market outcomes could be designed for the real-time balancing business.

On the one hand, the business is required to invest in a certain quantum of tangible and intangible fixed assets, which are at risk of asset stranding unless the regulatory approach provides an explicit provision for recovery of this capital together with an appropriate return. Investors are unlikely to be willing to be appropriately incentivised to invest funds in developing and maintaining the infrastructure required to operate a balancing activity in the absence of an adequate return on these assets.

On the other hand, a return on fixed assets alone is unlikely to be sufficient to provide adequate headroom to manage exposures associated with system failure and system quality risks, which are largely invariant to the scale of the business's fixed assets. A regulatory approach exclusively based on a return on fixed assets would also incentivise the ESO to focus effort and resources on capital cost solutions in favour of operating cost solutions. This is commonly referred to as a capex bias and has been noted by a number of sources, including the National Audit Office[2], Ofwat[3] and Ofgem[4].

In the context of a business undertaking balancing activities, a capex bias is likely to have more detrimental consequences to consumers than an opex bias. This is because the value that the organisation adds to consumers is more closely linked to operating expenses than capex. For example, the means by which such a business delivers value to consumers include talent within the organisation, engineering expertise and intellectual property. It also coincides with a recent shift in trend to more cloud-based operations rather than direct ownership of IT assets. Costs incurred in generating this value are largely treated as operating expenses, and would not be capitalised and remunerated under a approach that solely tied remuneration to a return on fixed assets.

These observations suggest that a hybrid approach towards the remuneration of the ESO's balancing activities is needed. This would combine a return on the fixed assets in the RAV with a margin on forecast internal operating costs.

The appropriate magnitude of the margin could be based on relevant market benchmarks, which are outlined below. The magnitude of the allowed return on the RAV is still under consultation by Ofgem, and subject to further refinements and updates. As such, an estimate of the appropriate allowed return is not set out in this report.

A hybrid approach of this type would satisfy each of the assessment criteria set out previously:

— **Reflective of risks and business characteristics**—the hybrid approach would ensure that the scale of remuneration aligned appropriately both with risks associated with recovery of capital investments and risks that are more closely tied to the scale of business operations.

— **Simulates economically efficient market outcomes**—the hybrid approach preserves incentives to deliver both capital investment and business operations efficiently, in a similar manner to the RAV*WACC approach. Analyst reports suggest that investors tend to evaluate market-making businesses based on profitability metrics, such as total income and earnings per share. This suggests that the application of a margin is consistent with competitive market outcomes. On the other hand, the application of a separate return on the RAV is less aligned with market practice. Therefore, the hybrid model is more closely aligned to market practice than either a pure return on the RAV or a pass-through model.

— **Ensures financeability of the company**—where calibrated based on appropriate market benchmarks, the hybrid approach of RAV*WACC plus margin on forecast internal costs would ensure the financeability of the business by ensuring that investments in fixed assets could be recovered with an appropriate return, whilst providing sufficient headroom to cover risks that are unrelated to the scale of the RAV.

By contrast, remuneration based solely on the application of a return on the RAV would be insufficient to ensure the financeability of the business. This is because the ESO's RAV is too small to provide sufficient headroom to manage the risks to which the ESO is exposed, many of which are unrelated to the size of the business's fixed assets.

The short asset lives of the IT systems which make up the RAV mean that returns which were entirely calculated based on the application of a return to the RAV would fluctuate in a 'saw-tooth' profile over time. This could mean that the allowed remuneration for the ESO could be volatile and unpredictable.

[2] National Audit Office (2002), 'Pipes and wires: report by the comptroller and auditor general', HC 723 Session 2001-2002:10 April 2002, p15.
[3] Ofwat (2011), 'Capex bias in the water and sewerage sectors in England and Wales – substance, perception or myth? A discussion paper'.
[4] Ofgem (2010), 'Introducing the RIIO model: City briefing', July, p26.

A pure RAV*WACC approach would also not provide appropriate incentives to drive consumer value where this was linked to operating cost solutions, which could be the case in a significant proportion of instances.

A remuneration approach based on passing through the relevant costs with no corresponding profit margin would be inappropriate for the reasons described in Section 1. No entity would be willing to undertake a business activity that does not earn any profit, and no investor or lender would be willing to commit capital to such a business. This is particularly the case in the context of the ESO, which would face significant exposures in the event that it discharged its responsibilities in a suboptimal manner. Any ex post review of the ESO's costs would create risk for the ESO which would also have to be remunerated. A approach that provided no remuneration for the risk associated with regulatory disallowance would not be financeable.

The business would face working capital requirements even under a regulatory approach where costs were fully passed through into revenues with no ex post review. This is because pass-through of costs is typically structured based on an ex post true-up. This means that the ESO would still need to finance the activity during the intervening period between when the cost is incurred and the point at which the cost is recovered through regulated charges. Even where costs are pre-funded through an upfront payment, the business would still be required to draw on its capital resources where the actual costs exceed the upfront payment. This means that working capital would need to be funded even under a pass-through approach. This cannot be managed through a pure debt-based facility since for this activity, there will always be a risk of cost disallowance.

These considerations suggest that an appropriately calibrated hybrid remuneration model of the type described above is likely to be more appropriate than either a pure RAV*WACC model or a pass-through model with no profit margin.

Comparison to current consultation

The proposals currently being consulted on by Ofgem include either a pure RAV*WACC model, or a full cost pass-through model.

In the December consultation a pure margins based approach was suggested.

It is likely as set out above that a hybrid approach of both of these models is likely to be most appropriate.

Benchmarks for determining appropriate scale of remuneration

This section considers margin benchmarks for appropriate returns that the ESO should earn on its real-time balancing business to inform the regulatory approach described above. There is a regulatory precedent for the use of margins in remunerating asset light businesses. The CMA has used margins for benchmarking returns and profitability in the context of regulatory appeals and market investigations for asset-light businesses.[5]

In the current context, the operating margin exhibited by securities exchanges such as the LSEG could represent an appropriate benchmark for the ESO margin on balancing costs. The LSEG is made up of a number of divisions including capital markets, information, post-trade and technology. Based on analyst reports, the capital markets division of the LSEG is forecast to earn an operating margin of 17.7% on average from 2018 to 2021.

Broadly the capital markets division of the LSEG is comparable to the real-time balancing activities that the ESO undertakes but there are some areas where the exposure of risks differ. The ESO performs a function that is likely to have more significant ramifications for the broader economy and population than the LSEG. The ESO is required to ensure that the supply and demand for electricity balances on a continuous basis, which is likely to be a more binding constraint than faced by LSEG. LSEG do not operate at weekends and other public holidays whereas the ESO operates continuously and therefore is exposed to a more continuous operational risks. On the other hand, the capital market group of the LSEG also operates in jurisdictions outside of the UK including some higher growth markets.

The 17.7% margin for the LSEG implicitly includes an element of remuneration of fixed assets, and hence is not directly comparable to the margin on internal operating costs for the ESO. For illustrative purposes if the WACC for the TOs proposed by Ofgem in its sector-specific methodology decision document of 4.55% were applied to the ESO's RAV and the resulting RAV return deducted from an overall margin of 17.7%, the resulting net margin for comparison would be 13.9%. There is merit in also looking at other securities exchanges and bourses to obtain benchmarks for the ESO. However, given that most exchanges do not publish their annual reports publicly, the estimates provided in this report are limited to the LSEG's.

[5] *Competition Commission (2013), 'Guidelines for market investigations: Their role, procedures, assessment and remedies', April, Annex A, Paragraph 9.*

03

Future systems function

This section discusses business characteristics, risks and financing requirements of the ESO's future systems function, and their implications for deriving the appropriate, targeted regulatory regime that can effectively approximate an efficient, competitive market outcome for the provision of these services. It draws a comparison between the future systems function and *professional services firms* as appropriate, business comparators, which can be observed in competitive market.

The future systems function describes a set of activities and roles that are largely reliant on the skills and expertise of its employees.

The ESO plays a vital role in driving the electricity network. It provides long-term forecasts for the sector as a whole based on its position as the operator of the electricity transmission system and its resulting privileged access to data and information. This position also enables it to provide high-quality real-time data for users of the electricity system and other interested parties.

The ESO currently administers the process of allocating CfDs for certain generation technologies, demand forecasting and running Capacity Market auctions. As part of this function, it conducts the pre-qualification process, agreement management following Capacity Market contract award and managing the appeals process. They are also responsible for ensuring that the rules and processes for procuring balancing services maximise competition where possible and are simple, fair and transparent.

The ESO also acts as code administrator for the Connection and Use of System Code ("CUSC") contractual approach for connection to, and use of, the National Electricity Transmission System (NETS), the Grid Code and the System Operator – Transmission Owner Code (STC). In essence, the ESO's future systems function has an influential role in setting the approach and rules for operating the GB electricity transmission network. Additionally, it also plays an important part in engaging industry parties to propose changes, debate important issues and drive key outcomes in code modification processes.

Additionally, the ESO is responsible for publishing the Network Options Assessment (NOA). The NOA develops an efficient, coordinated and economic system of electricity transmission. It describes the major projects considered to meet the future needs of Great Britain's electricity transmission system and recommends which investments in the year ahead would best manage the capability of the GB transmission networks in this challenging energy transition.

Competitive market comparators to future systems business

The key competitive market benchmark for the future services function are professional services firms that provide consulting and data analytical services. This is premised on the following similarities in their respective business models:

The output produced by both entities principally comprises the provision – often in the form of formal reports – of information, analysis and advice. The value of the output is intangible, difficult to quantify robustly and dependent on the circumstances of the user.

Collectively, these activities are akin to those of a professional services firm that provide consulting and data analytical services, specifically technical consultancies and specialised economic consultancies. They require a certain amount of software and IT equipment (together with overheads such as premises and corporate functions), but are overwhelmingly reliant on the skill and expertise of qualified, trained and experienced employees. Beyond the above, almost no tangible assets are required for the operation of this business activity. The assets that are employed are generally short-lived and represent a small proportion of overall costs.

In the absence of any significant tangible assets, business activities such as those set out above generally exhibit limited debt capacity (if they are able to access debt finance at all). Debt facilities will tend to be short-term, working capital facilities used to fund intra-year cash outflows. Such businesses may also enter into operating leases in respect of some assets (e.g., premises, equipment), such as cloud systems that are becoming increasingly deployed.

Key risks associated with future systems function

The key risks associated with the future systems function stem from the responsibilities it bears from facilitating competitive network investments and planning of the electricity network system.

As the future systems function is driven by technical experts and professionals, it is susceptible to litigation risks, staff attraction and retention risks, as well as risks from human errors and operational risks, which are discussed as follows:

— **Operational risks** in the forms of IT system failures, data loss and cybersecurity breaches can result in significant exposures relative to the scale of the ESO's business operations, which might not be recoverable through regulated charges. Additionally, due to the prominent role the ESO plays in the energy network, any operational failures may halt network operations, which could result in reputational risks and litigation risks.

— **Risks from human errors** also affect the ESO in respect of its forecasting and research activities. As the ESO sits at the heart of the energy system and is effectively responsible for network planning, producing incorrect or misleading forecasts can result in reputational damage, loss of confidence and significant scrutiny from market participants and regulators.

— **Staff attraction and retention risks** are especially prominent for the ESO's future systems function as it relies almost purely on highly qualified and specialised employees. Therefore, the ESO needs to offer competitive compensation packages and promote a good organisational culture in order to attract and retain the pool of talent it needs. Otherwise, it would be difficult for the ESO to achieve desired outcomes for the network, such as a more efficient, resilient and greener grid.

— **Cost risks** are significant since it is hard to predict with certainty the exact amount of time and effort required to produce the outputs. The business is very exposed to cost overruns since most of its overheads are fixed, while its workload is variable which may require external support.

— **Timing risks** relating to the on-time publication of reports, forecasts and datasets exist since it is difficult to predict and manage the production of such deliverables. The impact of lateness could be financial and reputational damage.

— **Litigation risks** may arise from the ESO's market-making activities, such as the administering of CfD allocations, capacity market and other network competitions. Failure to conduct these processes in a robust and transparent manner, or if there are perceptions of bias, can expose the ESO to the risk of litigation by market participants. Additionally, inefficiency in respect of these activities, such as the selection of an inappropriate candidate, can result in higher costs being incurred by consumers resulting in significant scrutiny or government/regulatory action being applied to the ESO.

Future systems function risks

Financeability considerations of future systems function

Future systems business activities are funded with working capital with the necessary support of risk capital, and have little requirement for financing long-term fixed assets. At the same time, the business will rely extensively on the long-term development and retention of talent and expertise within the business. This may involve the creation of intangible assets via investment in skills and recruitment of high-calibre staff.

The business needs to maintain a sufficient layer of capital to cover potential exposures associated with risks related to its market-making activities (particularly litigation).

Likewise, a future systems business also needs to maintain sufficient working capital to fund operating expenses in an environment where the timing of revenues can be uncertain – and can lead to the business having to fund these expenses using its own working capital resources instead of through cash income.

These observations suggest that a number of financeability metrics may be relevant. There is considerable evidence from the way in which both asset-light and other businesses conduct corporate financial management and financial planning to suggest that investors evaluate the financeability of asset-light businesses based on margins.

Credit rating agencies refer extensively to margins when rating asset-light businesses: although credit rating agencies do not have a single overall assessment methodology for evaluating asset light companies, they have issued some specific guidance for particular sectors, including:

— In Moody's methodology on rating business and consumer services[6], Moody's assigns a 100% weighting to EBITDA margins when determining the profitability rating factor which in turns contributes 10% to the overall rating. Similarly, margins make up 100% of operating performance in the global telecommunications industry[7] and 50% of efficiency and profitability in the postal and delivery industry[8].

— Moody's also states in its methodology for the global telecommunications industry that 'the level and stability of operating margins are key considerations in assessing risk to debt holders'.

— S&P often cites the level and volatility of margins as the primary metric for profitability ahead of return on capital measures for asset light industries. Sectors include the branded nondurables[9], telecommunications and cables[10], health care services[11], and media and entertainment[12].

— Fitch makes distinctions between businesses with "high balance sheet usage" and "businesses with low balance sheet usage". In its rating criteria for non-bank financial institutions[13], Fitch states that for "asset-light strategies, operating margins are a common indicate for profitability" as opposed to asset and equity yields for "balance sheet-intensive businesses.

Appropriate thresholds for testing financeability based on margins are set out below.

Measures such as EBIT or revenue per headcount can also be relevant, since they reflect the requirement to recruit skilled and experienced personnel and can provide an indication of whether the business is adequately staffed.

Liquidity is also important to these businesses, and metrics pertaining to the adequacy of working capital are relevant. For example, professional services businesses often use debtor days, bad debt as a percentage of revenue and other measures pertaining to receivables to assess their own financial health. These metrics tend to vary considerably across professional services businesses and over time, and are generally not available in the public domain. As such, it may be more appropriate to rely on measures of liquidity that compare measures of working capital to expected short-term cash outflows. The liquidity coverage metric referred to in the collection agent function section (Section 4) effectively captures this concept, and a similar threshold (i.e., 100%) could also be appropriate in the context of a future services business.

Similarly to the collection agent function, financial exposure is also an important financeability consideration requiring risk capital – e.g. due to the possibility of low-probability, high-impact events such as litigation. In this context, it is likely to be necessary to quantify an expected exposure based on historic cash outflows and/or value-at-risk modelling, and to explicitly model scenarios where such events take place to assess whether the business has sufficient capital resources to manage these risks.

[6] Moody's (2014), 'Business and Consumer Service Industry
[7] Moody's (2010), 'Global Telecommunications Industry'.
[8] Moody's (2011), 'Global Postal and Express Delivery Methodology'.
[9] S&P (2015), 'Key Credit Factors For Branded Nondurables Industry'.
[10] S&P (2014), 'Key Credit Factors For The Telecommunications and Cable Industry'.
[11] S&P (2014), 'Key Credit Factors For The Health Care Services Industry'.
[12] S&P (2013), 'Key Credit Factors For The Media and Entertainment Industry'.
[13] FitchRatings (2016), 'Global Non-Bank Financial Institutions Rating Criteria'.

Implications for the design of the regulatory approach

This section discusses the design of an appropriate regulatory approach for the ESO's future systems business and relevant benchmarks for efficient remuneration from comparator businesses in competitive markets.

The criteria set out in the Introduction suggest that a margin applied to forecast internal operating costs is likely to be an appropriate basis for remunerating the ESO:

— **Reflective of risks and business characteristics**—given that this activity is almost entirely reliant on the expertise and skill of ESO's employees (with very limited tangible capital requirements), a regulatory approach that remunerates these activities based on a margin on forecast operating costs is likely to be far more appropriate than remuneration based on capital invested. There are potentially significant exposures associated with these activities, some of which were outlined above. The scale of these risks is likely to be correlated with the scale of the future systems function, which can be proxied by the business's internal operating costs. As such, the scale of remuneration under a margin-based approach will scale appropriately with the magnitude of the risks faced.

— **Simulating economically efficient market outcomes—**professional services businesses focus primarily on profitability metrics in their day-to-day corporate financial management. This suggests that the application of a margin to forecast operating costs is in line with market benchmarks. A margin on internal operating costs will preserve the incentive for the ESO to deliver outputs efficiently since it will continue to benefit from cost efficiencies under this approach.

— **Ensuring financeability**—an appropriately calibrated margin based on competitive market benchmarks will enable the business to adopt an appropriate and viable financial structure

By contrast, there are a number of drawbacks associated with a approach that would aim to pass through all costs associated with this activity into regulated charges without providing for any profit margin or return, as proposed by Ofgem.

Even under a pass-through approach, the business would continue to require access to working capital. This could relate to funding differences in timing between the point at which costs are incurred and the point at which costs are recovered through regulated charges, where an ex post true-up is adopted. Alternatively, it could relate to mismatches between forecast and actual costs where costs are prefunded through regulated charges. In the absence of a profit margin, the business would have no means of financing working capital. Again a debt based facility cannot be used to bridge this working capital risk since there is no guarantee that all costs are fully recoverable, nor is there any ability to collateralise with equity since there is no equity buffer in the business.

Where costs were subject to ex post review, the business would be exposed to risk associated with disallowance of costs deemed to have been incurred inefficiently. This risk would need to be remunerated in order for the business to remain financeable, but no remuneration would be available under a pass-through approach.

More generally, the profit margin represents a reward for the efficient management of the business on a day-to-day basis, and for the entrepreneurial capital involved in doing so. The absence of any profit margin would deprive the business of any incentive to manage the business appropriately.

Comparison to current consultation

Given the drawbacks of a model that allows full cost pass-through, the current consultation that recommends a pass-through approach is unlikely to be the most appropriate model. By contrast the December consultation proposed a margins based approach which is in line with the recommendation above.

Benchmarks from competitive market comparators to the ESO's future systems function

In order to develop an appropriate benchmark for the margin on internal operating costs associated with the future services function, EBIT margin data of 1,442 companies that are domiciled in the UK were collected from Thomson Reuters Eikon. Companies were filtered to include those grouped under the Professional and Commercial Services industry (as per Eikon's categories) and 72 companies were identified under this category.

On average, these businesses exhibited an EBIT margin of around 11% over the most recent three-year period for which data is available. Given the similarities between professional services businesses and the ESO future systems function, this could represent a reasonable basis for estimating the required margin on internal operating costs corresponding to this business activity. However, note that the EBIT margin reported here represents the average across a broad group of professional services firms. Therefore, the EBIT margin for the ESO's future systems function needs refining, which is beyond the scope of this report.

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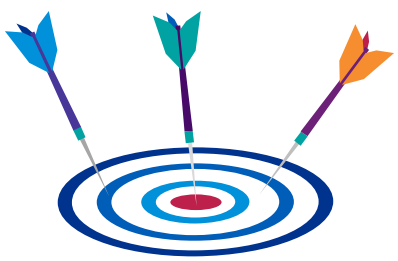


04 Collection agent function

This section discusses business characteristics, risks and financing requirements of the collection agent function, and their implications for deriving the appropriate, targeted regulatory regime that can effectively approximate an efficient, competitive market outcome for the provision of these services. It draws a comparison between the collection agent function and a *medium-size, focused financial institution* that also provides financial services, as an appropriate business comparator which can be observed in the competitive market.

The ESO undertakes a collection agent function where it is responsible for the collection of the TNUoS and BSUoS charges, which represent the largest part of its revenue stream. In addition, the ESO also collects a number of other smaller streams, such as connection charges.

TNUoS Charges

TNUoS charges recover the cost of installing and maintaining the transmission system in England, Wales and Scotland and Offshore. These are paid by users of the electricity system, namely electricity suppliers and generators, collected by the ESO and passed on to the TOs. Generators are charged according to their Transmission Entry Capacity and suppliers are charged based on their actual demand.

The payment terms and calculation methodology for TNUoS are set out in the CUSC which is managed and administered by the ESO. The quantum of these charges is generally very large relative to the ESO's internal costs and revenues and the ESO has very little influence on these charges. For example, in 2018 the ESO collected £2.6bn in TNUoS charges and incurred internal operating costs of approximately £100m (from RIIO-1).

TNUoS charges must be paid by the ESO to the transmission network irrespective of whether the equivalent charges have been paid by users of the electricity system to the ESO. Therefore the ESO is exposed to liquidity risk where the ESO must finance a proportion of payments from its own internal sources to meet payments due to the TOs.

BSUoS Charges

The ESO also recoups the cost of balancing the electricity transmission system in real-time from users of the electricity system through BSUoS. BSUoS charges recover the costs incurred for balancing the system and the system operator function of real-time balancing as discussed in Section 2. They are calculated and settled in accordance with the statement of Balancing Use of System Charging Methodology. BSUoS charges are paid by generators and suppliers and are based on a half hourly £/MWh basis and are applied proportionately according to the portfolio share.

BSUoS charges are made up of external and internal components. External components are the monies that the ESO pays providers for delivery of balancing services and the internal costs are the business costs of providing this function such as buildings, systems and staff.

The process of balancing the electricity transmission system in real-time should be considered to be a separate activity to the collection agent function. However, the process of incurring and recouping the costs associated with these activities should be considered to be a part of the ESO's collection agent function. This is because the ESO collects BSUoS charges on behalf of the industry from users of the electricity system and pays providers for balancing services. In 2018, the ESO incurred and recouped approximately £1.2bn of BSUoS charges.

Volatility of TNUoS and BSUoS Charges

TNUoS charges are based on the allowed revenues for the TOs determined under the RIIO price controls. They are translated into charges based on forecasts for electricity usage and transmission exit capacity.

Since allowed revenues, usage and capacity can all be forecast with relative precision, TNUoS charges tend to be less volatile and more predictable than BSUoS charges. BSUoS charges by contrast are volatile and difficult to predict. Therefore, the difference between forecast and actual costs can be high. This is because BSUoS is dependent on the extent to which the electricity transmission system is out of balance, such as whether too much or too little electricity is being produced relative to demand. This is considerably less predictable than overall usage, since it is a function of many existential factors that are difficult to forecast including unexpected outages, transmission infrastructure faults, human behaviour and the weather.

Competitive market comparators to collection agent function

The collection agent function is, at its heart, a financial management activity, akin to activities performed by a medium-size, focused financial institution.

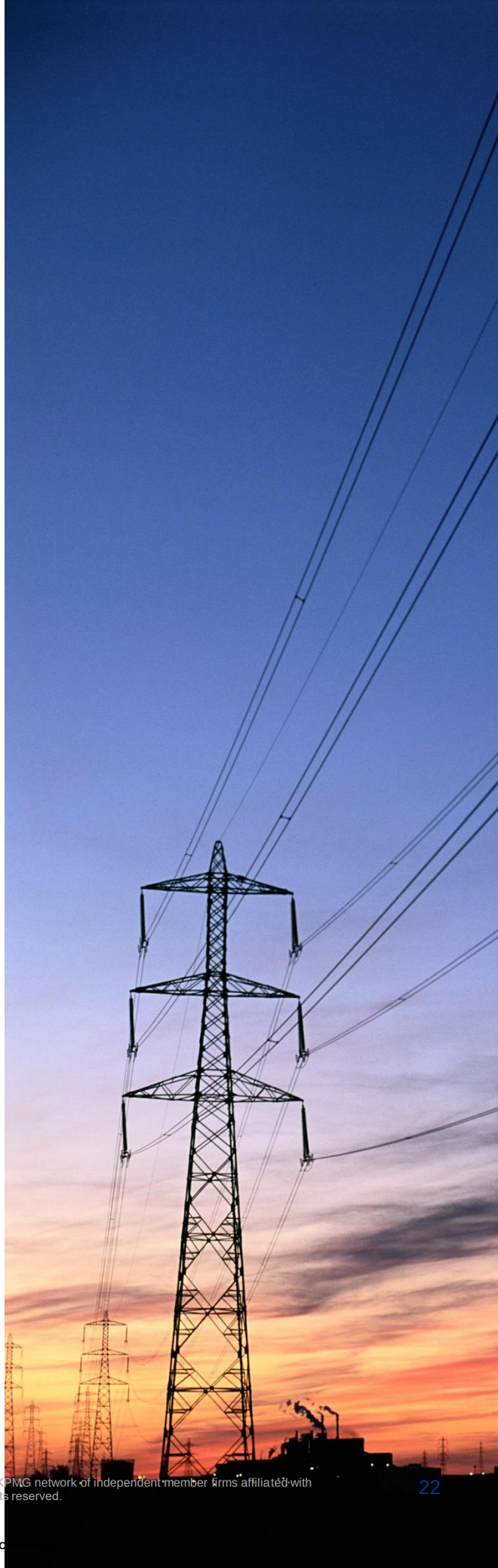
At the most basic level, this business is similar to financial intermediation based on a large balance sheet with financial assets and liabilities changing dynamically over time.

This comparison was explicitly made by the CMA in the context of the SONI appeal, which noted that "SONI is effectively providing a cash flow management service to the industry".[14] The key competitive market benchmark for the collection agent function is therefore a simple, but large, financial intermediary. Like financial intermediaries, the ESO advances sums of money on behalf of consumers to consumers' counterparties. In the case of the ESO, these counterparties are the TOs, which are analogous to a merchant in the case of a financial transaction. The TOs, like a merchant, provide services upfront (in this case, the availability of the electricity transmission system) and are reimbursed via the advances provided by the ESO. The ESO then performs an analogous function to the financial intermediary by assuming responsibility for collection of the corresponding sums from system users.

The ESO – like a financial intermediary – is faced with uncertainty regarding the scale, frequency and timing of transactions, as well as the scale, frequency and timing of repayments by users. Unlike most financial intermediaries, the scale of the transactions is potentially unlimited. By contrast, financial intermediaries generally place upper limits on the amounts that can be drawn down by consumers at any given point in time. The frequency and timing of repayments to the ESO, however, are less uncertain than a financial institution's.

Where financial intermediaries advance funds to consumers, these create balance sheet assets that are reduced as the relevant sums are repaid. As such, the sums advanced by the ESO can be considered to create an asset from an economic perspective, notwithstanding that these amounts are not actually recorded on the balance sheet of the ESO under the current accounting standards adopted.

Some examples of market comparators that perform this function are discussed on the next page.



Credit card issuers

The task that the ESO performs in collecting revenues from users of the electricity system and paying these to TOs is comparable to the functions carried out by credit card issuers – which advance funds on behalf of their customers to merchants) – and credit card associations, such as Mastercard and Visa – which provide the technological platform over which the relevant transfers take place.

Credit card associations act as an intermediary between the merchant's bank and the credit card issuer. When a customer makes a credit card purchase, the merchant's bank seeks authorisation from the customer's issuing bank via the credit card association. The credit card association then submits the transaction to the customer's issuing bank for authorisation. This is a system built on trust and reputation, and the credit card association charges the merchant an assessment fee for this service. In the same way, the ESO acts as the intermediary between users of the electricity system and TOs to provide a highly secure payment transfer system and bears the same business and reputational risks as credit card associations.

The financing function of the ESO's collection agent function is comparable to the role of credit card issuers. Upon authorising a credit card transaction, the issuing bank makes an advance payment to the merchant's bank on behalf of the customer. The customer then pays the issuing bank at a later date according to their credit card terms. Although a credit card transaction is typically only approved when there is high certainty of future recovery, the issuing bank is still exposed to short-term credit risks, which also exposes it to liquidity and financing risks. Therefore, it charges an interchange fee to the merchant. For the ESO, the advancement of funds to TOs before payments are received can be seen as a loan asset similar to a payment advancement that an issuing bank makes to the merchant. For this reason, the ESO is also exposed to similar liquidity, financing and short-term credit risks that an issuing bank faces.

Remittance services

Remittance services represent a further potential comparator. These services operate on a pay-when-paid basis, and are not generally required to put their own capital at risk to fund advances in the same way as the ESO. The service provider only bears reputational and business risks such as the risk of making transaction errors and security breaches.

An example of such a service provider is PaySend, which is an electronic money institution that processes global card-to-card transactions instantaneously. PaySend charges a fixed £1 transaction fee for each transaction processed regardless of the size of the funds involved. This reflects the fact that these businesses bear no exposure to the underlying funds.

Remittance service providers therefore potentially provide a benchmark for the operating risks associated with the collection agent function (i.e., excluding any exposure to the funds being collected and disbursed).

Invoice factoring

The ESO's collection agent function is also similar to an invoice factoring arrangement, under which a company sells its outstanding debtors invoices to an invoice financing company or "factor". The factor will then advance a proportion of the value of the invoices, releasing cash to the company. Consequently, the factor will assume responsibility for collecting and managing the debts.

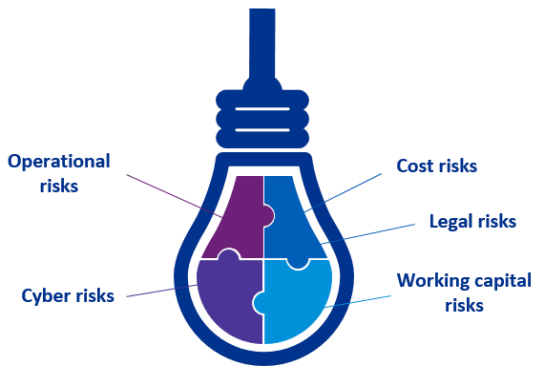
The company will retain liability for any unpaid debts when the invoice financing agreement is being made on a recourse basis. Under this agreement, the fees charged are for cash-flow management and administration services, as well as the provision of short term cash-flow. However, in some cases, factors will also offer non-recourse factoring services, taking on the risk of the unpaid invoice not being paid by the debtor. In this case, the factor takes on additional credit risk which is reflected in an increased fee.

The structuring of invoice factoring fees has a number of similarities with the structuring of ESO's price control. Both entities advance funds on behalf of their customers and are exposed to uncertain timing and profile of repayment. However, there are also important differences. In particular, invoice factors tend to be exposed to significant credit risk under non-recourse arrangements, to a considerably greater extent than the ESO.

Key risks associated with the collection agent function

The collection agent function as a business activity is exposed to a number of risks associated with the day-to-day financial operations discussed below.

- **Operational risks** relating to the quality of the function. The consequences of process failure in respect of the collection agent function can have a significant negative reputational impact on the business or could lead to litigation. This is exacerbated by the expectation of zero errors, e.g. a very low tolerance for any failure
- **Cyber risks** are increasing in likelihood and sophistication. The impact of a successful attack could range from being locked out of key systems or datasets (e.g. ransomware) to an inability to move funds, or funds being removed, in turn leading insolvency of some market participants.
- **Cost risks** relating to the operational and capital expenditure associated with running the system. Given the specialist nature of both the employees and the IT infrastructure, in turn leading to a lack of liquidity in terms of supply of goods and services, there is a risk that the costs of running the business are higher than expected.
- **Legal risks** resulting in litigation and financial and/or reputational loss as a result of failing to comply with license conditions, regulation or legislation either wilfully or inadvertently. This is most likely to be in the form of a data breach.
- **Working capital risk** which stems from the obligation of the ESO to pay TNUoS charges to TOs and to incur BSUoS costs irrespective of whether the ESO has collected these charges from users of the electricity system. The following risks result from this risk driver.
  - At different points in time, the business may receive funds from system users before or after the ESO is required to pay these charges to the TOs. The ability of the ESO to use surpluses to offset shortfalls is limited, since it has limited scope for investing surpluses given their short duration and uncertain timing. Where shortfalls emerge, these must be funded via the ESO's own capital resources.
  - The size of these deviations is highly uncertain: the magnitude of the shortfalls and surpluses to which the business may be subject cannot be known in advance. There is no upper limit to the size of potential shortfalls. This has the implication that the ESO may not have access to sufficient committed sources of capital to fund potential shortfalls. In particular, the ESO may not be able to source adequately sized debt facilities at sufficiently short notice to be able to fund larger-than-expected shortfalls.
  - There is considerable uncertainty of timing when past deviations are ultimately balanced i.e. how long the ESO must finance the timing difference in payables and receivables. This means that the advances to be funded from the ESO's own capital resources are of indeterminate duration with no upper limit to the length of time that the shortfalls will persist.
  - The ESO is also exposed to a degree of credit risk due to the possibility that individual users of the electricity transmission system do not pay charges owed by them on time or in full. However, non-payment of TNUoS and BSUoS charges by users of the electricity transmission network can be recovered with a high degree of confidence in future periods. In the short-term this requires funding which represents a credit risk exacerbating the other risks identified above.



Collection agent function risks

Financeability considerations of the collection agent function

At a minimum, a business undertaking the above activities would need to have access to financing that would enable it to fund advances to the TOs until these were recovered from users of the electricity system. Financing would also need to be available to cover day-to-day working capital requirements and any investment in systems and IT. The required financing would need to exhibit a number of characteristics:

— **It cannot be assumed that the business will finance itself solely with debt since no debt provider will accept 100% leverage**—some equity buffer will be necessary to take on various residual risks as for any other financial activity (e.g. operational risks, refinancing risks, to ensure that (even limited) credit risk can be managed, events etc.).

— **The amount of equity capital invested in the business needs to be sufficient to ensure that the business remains solvent at times** where it must fund significant advances. This either requires a significant equity capital commitment upfront or a contingent capital arrangement.

— **The business needs to maintain a sufficient buffer of cash and liquid assets available to meet operating and financial requirements**. Equity capital that is invested in the business in the form of illiquid, fixed assets is insufficient.

— **Financing needs to be obtained on terms that enable the ESO to draw down and repay potentially significant amounts of cash at short notice**. This generally requires the use of a revolving credit facility and hence generally involves payment of a commitment fee and a maximum balance.

The metrics employed by investors and regulators of financial institutions reflect these considerations. These metrics generally focus on the risk exposure and hence on the liquidity and solvency of the business. For example, the Basel regulatory approach specifies metrics in each of these areas that are intended to facilitate monitoring of financial institutions for regulatory purposes. Since the collection agent function is in effect a financial activity, these metrics can usefully be applied to the ESO.

The Basel approach specifies capital adequacy ratios intended to test the solvency of financial institutions. This requires that financial institutions hold a minimum proportion of high-quality capital (Tier 1 Capital[15]) against its assets, where the assets are weighted according to their risk characteristics (higher risk assets are assigned higher weights). Note that this refers to capital available explicitly or implicitly. The minimum threshold for capital adequacy specified under Basel is 10.5%.

In the context of the ESO, this ratio would essentially test whether the business holds sufficient high quality capital to support the possible advances it may need to make to TOs on behalf of users of the electricity system. Unlike banks, the ESO is unlikely to possess exotic sources of capital, hence this measure of capital has a more straight-forward interpretation for the ESO. As for the ESO's loan assets (i.e., the advances to TOs), they can be considered relatively low-risk, but not risk-free, as the ESO is still exposed to credit risk in the short-term.

There are some options in weighting risks for some claims, and the following table provides a summary of how they are implemented under the Basel regulatory approach's standardised approach. Since ESO's loan assets have low credit risks, the following assets could be used as benchmarks for determining the ESO's minimum capital requirement. Based on this, a reasonable estimate of the risk weights assigned to ESO's assets could be within the range of 20%-35%. However, further analysis should be carried out to estimate the precise values applicable to the ESO.

[15] *Tier 1 capital is a bank's core capital, which consists primarily of common stock and retained earnings.*

Standardised risk weights for low-risk asset groups

Asset	Risk-weighting
Interbank lending	For short-term interbank claims with a maturity of three months of less, banks may apply a 20 percentage point reduction to the risk weight assigned based on their own external ratings (e.g. credit ratings). However, the risk weight applied must be above 30%.
Sovereign debt	Risk weights of 20% are assigned to sovereign debt of countries with credit ratings of A+ to A- on OECD's Country Risk Classification
Claims secured by residential property	Assets backed by collaterals attract a risk weight of 35%.
Depository institutions and credit unions	Risk weight is 20% for US-based, otherwise risk weight is correlated to Country Risk Classification for foreign banks
Public sector entities	20% risk weight for general obligations
Government-sponsored enterprise (GSE)	20% risk weight to non-equity exposure to GSE

The Basel approach also specifies a minimum threshold for a liquidity metric: the liquidity cover ratio. This ratio requires that, at all times, financial institutions hold high quality liquid assets, such as cash and cash equivalents, that are greater than or equal to expected net cash outflows over a short forward-looking time period (30 days).

In the context of the ESO, the outflows in question would represent an estimate of the expected average advances to the TOs within a 30 day (or similar) period. This metric would therefore test whether the ESO possesses sufficient cash and equivalents to cover short term requirements to fund advances to TOs on behalf of consumers at all times.

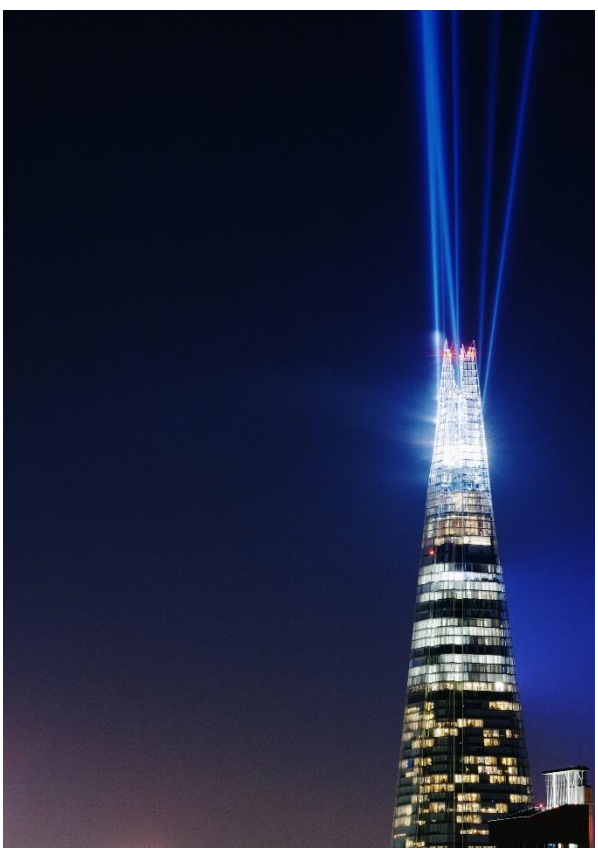
The Basel approach also specifies minimum thresholds in terms of exposure (i.e., tail outcomes with respect to possible losses). One requirement under the approach specifies minimum levels of funding availability under pre-specified stress-tests. The leverage ratio, which requires financial institutions to hold a minimum quantum of Tier 1 Capital against Total Exposure, has a minimum threshold of 3%. The implications for the ESO are that they are required to hold sufficient high quality capital with respect to the cash advances that they make to TOs as loan assets.

Implications for the design of the regulatory approach

This section sets out how an appropriate regulatory approach could be designed for the collection agent business.

The criteria set out in the Introduction suggest that a margin applied to forecast TNUoS and BSUoS charges is likely to be an appropriate basis for remunerating the ESO:

- **Reflective of risk and business characteristics**—in the case of the collection agent function, the principal risk driver is the expected size of the revenues being managed. Larger revenues, and hence larger potential advances to the TOs imply a greater need for working capital – both in terms of the maximum balance of the debt facility and the size of the corresponding committed or contingent equity buffer. It is therefore logical for the scale of remuneration to be proportional to the size of expected external revenues.
- **Simulating economically efficient market outcomes**—a number of the competitive market comparators outlined in Section 2 structure their charges as a proportion of the total amounts being collected and disbursed. This suggests that the application of a margin to forecast TNUoS and BSUoS charges is in line with market benchmarks. This approach could potentially encourage the ESO to put forward inflated estimates of the relevant charges in order to increase its allowed remuneration. However, in practice, there are constraints on its ability to do so: Ofgem will be able to scrutinise these estimates using its own forecasts, and the determination of TNUoS charges is largely a function of the revenue determination for the TOs (and hence outside the control of the ESO).
- **Ensuring financeability**—providing that the magnitude of the margin is appropriately calibrated based on relevant market benchmarks, the application of a margin will enable the ESO to support a viable financial structure, inclusive of a sufficient equity buffer with which to absorb shocks. By contrast, a full cost pass-through approach, even one that includes the costs of a working capital facility, has a number of drawbacks:
  - It implies that there is a single risk associated with the collection agent function – namely, the recovery of costs associated with the drawing down of funds under a working capital facility. The approach proposed by Ofgem is intended to eliminate this risk by treating these costs as pass-through items, but does not provide any protection against other risks. For example, it does not take into account the risk that the balances that the ESO will be required to fund will exceed the maximum available balances under the facility. It also does not take into account the risks associated with the day-to-day operation of the business such as risks of system failure, fraud, cyber attack, as well as the high-impact of any process failure which is amplified by the relative scale of the managed cashflows relative to the scale of the business.



— There will be residual risks even in the presence of the pass-through mechanism. If the relevant costs are remunerated through allowed revenues on an ex post basis, then the ESO must fund the costs from its own capital resources during the intervening period between disbursement of funds and recovery of costs through allowed revenues. If the relevant costs are remunerated in advance (i.e., based on an estimate of forecast BSUoS and TNUoS charges), then the ESO is exposed to mismatches between forecast and actual charges. In either case, there remains a degree of residual risk exposure under the pass-through mechanism, for which there is no remuneration under Ofgem's proposals.

— A pass-through model also implies that the ESO can fund advances to the TOs at 100% gearing – since there is no proposed remuneration for equity funding under this model, this requires the assumption that the ESO will be able to fund any advances to the TOs solely using a working capital facility. This is doubtful. Even where no committed equity funding is required, the procuring of a working capital facility will be dependent on the availability of contingent equity, since no debt provider would be willing to lend without any equity buffer.

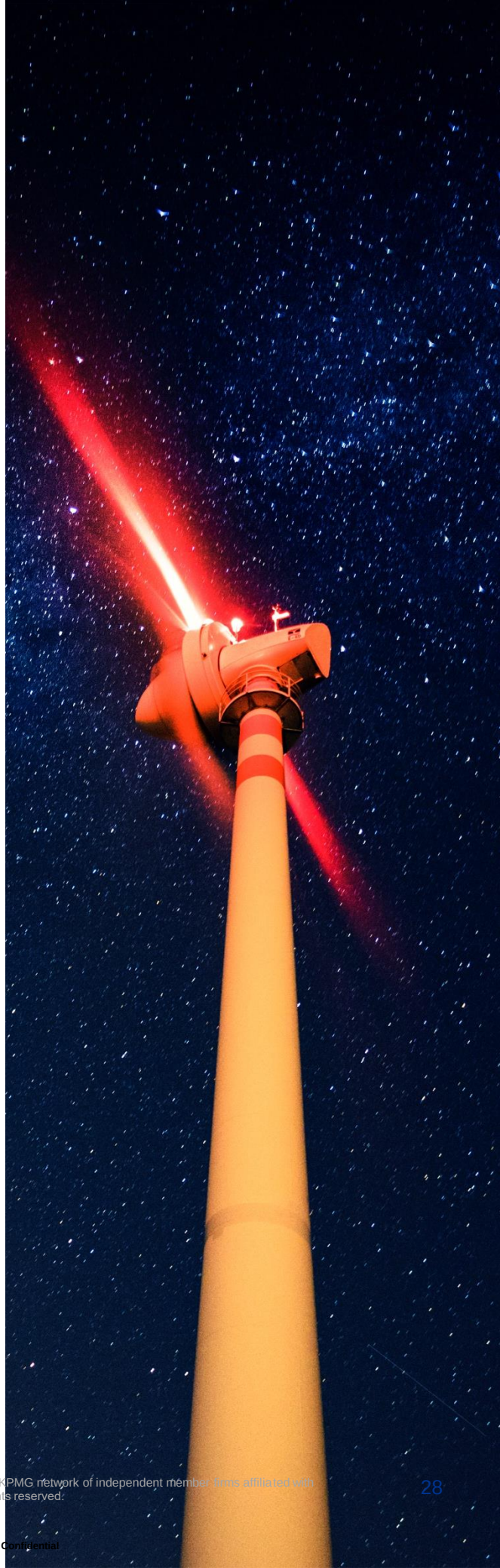
— Under a pass-through model there is also no market incentive to optimise internal costs/manage them efficiently – since the costs associated with the collection agent function are intended to be passed, the ESO would not benefit from better management of its costs, and hence would have no incentive to manage these flows efficiently.

Overall, the above observations suggest that a margin on forecast TNUoS and BSUoS charges is preferable to a pass-through model. The use of forecast rather than actual charges removes any perverse incentive to inflate these costs though it should be noted that this risk is also mitigated through the wider incentive package as well as licence conditions.

Comparison to proposals in the latest consultation

The current consultation proposes a pass-through model which for the reasons outlined above will not be either financeable or in the best interests of consumers.

Market-based comparators suggest that the most appropriate model is a margins-based approach, as set out in the December consultation, which is also consistent with the CMA's determination in the case of SONI.



Benchmarks for determining appropriate scale of remuneration

Credit card fee structure

The ESO's collection agent function is akin to a combination of the roles of a credit card association (e.g. Mastercard or Visa) and an issuing bank. Therefore, a suitable benchmark for the ESO's remuneration is the total of credit card assessment fees and interchange fees.

Mastercard charges an assessment fee of 0.13% on gross deposit volume to merchants for being the intermediary between the merchant and the issuing bank. This assessment fee covers the reputational risks, risks associated with human error and security breaches. Since the ESO is also exposed to short-term credit risks, which exacerbate liquidity and financing risks, the ESO should also be remunerated for these risks. As such, interchange fees that issuing banks charge to merchants are relevant benchmarks. In the European Union, interchange fees are regulated and capped at 0.3% for consumer credit cards and 0.2% for debit cards. These fee caps provide a lower bound of what the cost would be to procuring a similar service. It would be likely that the actual costs for the ESO would be higher because:

— there is a much higher risk of imbalance for the ESO between inbound and outbound funds as card payments are declined if the money is not able to be taken from the card issuer;

— the length of time for those imbalances to be rectified is much higher for the ESO than for card transactions since it can take up to two years for the true-up to occur; and

— the volume of transactions being procured is significantly smaller than those conducted by card issuers. These reduced economies of scale are likely to make the unit costs higher.

Remittance services (PaySend Plc)

PaySend's fee structure consists of two parts. The first part is a flat fee of £1 per transaction regardless of the transaction size, while the second part is an exchange rate fee for cross-country remittances, and is not relevant to the ESO.

The flat fee payment could represent a useful benchmark for the cost of operating a payment system without any exposure to shortfalls or surpluses. However, it does not provide any useful information regarding the appropriate margin for the ESO in the context of its exposure to such imbalances. Hence, the transaction fee for remittance services providers is not a relevant benchmark for the ESO margin.

Invoice factoring

The structuring of invoice factoring fees has a number of similarities with the structuring of ESO's price control, which could be useful benchmarks for the ESO's regulatory approach. The table below illustrates the service charge fee measured as a percentage of turnover across a number of invoice factoring companies.

Service Charges for Invoice Factoring

Provider	Service Charge
Lloyds Bank Commercial Finance	1.2% sales turnover
Santander Invoice Finance	0.5%-3% of monthly turnover
RBS Invoice Finance	0.03%-5% of annual turnover
Hitachi Capital Invoice Finance	0.25%-3% of gross annual turnover

Given the similarities in the nature of the activity conducted by invoice factors to the collection agent function for the ESO, the service charge provides a relevant benchmark for ESO's collection agent activities.

However, two factors limit comparability in the current context. Firstly, there is a significant range of fees observed in the market for invoice factoring. It is likely that these reflect varying degrees of credit risk exposure, depending in part on whether the factoring arrangement is entered into on a recourse or non-recourse basis. The credit risk associated with recourse contracts is likely to be greater than for the ESO. Additionally, the fees above may also include an element of administration costs which the ESO can fully pass through under the current and proposed regulatory approach.

The above considerations suggest that the most relevant comparator set for the ESO's collection agent function are credit card issuers/associations. This also aligns with the CMA's decision around regulatory treatment of the same function for SONI.

05 ESO business as a whole

This section considers the three business activities discussed in the previous sections as a single, integrated business. It considers the characteristics of the combined ESO business, the risks to which it is exposed, its financing requirements and describes resulting financeability requirements and the implications for the setting the appropriate regulatory approach.

The combined ESO is a single business, which can be thought of as operating a focused, medium-size financial institution with selected financial activities, a sector-specific securities exchange (which also undertakes market-making activities), and a specialised professional services firm.

The activities and risks that these three functions undertake and manage are discrete and unique to their respective functions but also operate as a whole system with mutual cross-fertilisation to deliver on ESO's responsibilities and outcomes for consumers. The integrated ESO business model is summarised graphically on the right hand side.

The combined ESO is an asset-light organisation at the heart of the energy system that plays a fundamental role in facilitating whole system outcomes through a challenging energy transition. It is responsible for a wide range of activities, from keeping the lights on to long-term future planning of the energy system and maintaining the integrity of the whole sector. It is an amalgamation of three discrete activities that function together for the system to be operational as a whole.

As the ESO sits at the heart of the energy system, it has the unique capability of offsetting its own incremental costs by delivering significantly larger benefits to the wider network. It achieves this in the forms of lower balancing and network costs, while promoting an increasingly reliable and environmentally sustainable energy network. This is particularly relevant in the context of the GB 2050 net-zero carbon commitment.

Key risks and responsibilities associated with the ESO business as a whole

Each of the separate functions that make up the ESO is exposed to a multitude of business and operational risks. None of these functions are single-risk activities that only require a single mitigation or source of remuneration. The ESO is a complex multi-activity organisation that needs to manage a wide variety of risks including all the risks associated with managing day-to-day business activities.

The ESO is exposed to significant reputational and financial risks across the three activities it carries out. This is exacerbated by the very high level of expectation around electricity system availability, revenue collection and the critical nature of the provision of the ESO services.

Across all activities, the ESO is highly reliant on intangible assets, such as its people, software and intellectual property. This differs from a standard network utility, which relies on the quality of tangible assets. The ESO is also exposed to innovation risks as all the IT operational systems and software are bespoke.

The risks and responsibilities within each of the three functions are all relevant for understanding the ESO business as a whole, and for corresponding financeability requirements and implications for an appropriate regulatory approach. This would approximate the terms on which an independent, commercial investor would be able and willing to undertake and finance these activities in the most efficient manner on a standalone basis.

Summary of selected key risks for each of the three functions of the ESO

Real-time Balancing Function	Future Systems Function	Collection Agent Function
- Nationally critical service failure risks - Operational risks related to real-time balancing - System quality risks - Balancing staff attraction and retention	- Process risk related to market facilitation activities - Reputational risk of inaccurate or erroneous forecasting and research activities - Operational risks related to future services	- Volatility of shortfalls and surpluses of cashflows - Size of the deviations is highly uncertain - Limited predictability of cashflows - Uncertainty of timing of working capital requirements

Financeability considerations of the ESO business as a whole

The remuneration for all the ESO's risks requires a bespoke consideration of financing requirements.

The financing requirements and structure of the combined ESO business reflect the financing requirements of its constituent components. The risks that each of the ESO functions are exposed to are discrete and do not overlap. Therefore the financing requirements for the ESO as a whole are simply the summation of the financing requirements of each of the functions. In particular the key financing considerations from a commercial investor perspective are:

— The ESO will need to fund timing differences between receipts and payments of significant and volatile cashflows. This will principally be in relation to TNUoS and BSUoS charges;

— It will need to fund a certain amount of tangible and intangible fixed assets, largely associated with the balancing function, but also potentially to procure and retain talent and expertise in each of the functions separately as the skill sets required vary;

— It will need to fund working capital requirements associated with the day-to-day operation of the business. This is attributable to all of the business activities carried out by the ESO to some degree;

— It will need to have access to sufficiently liquid and high-quality assets (i.e., cash or equivalents) to fund significant one-off costs to which the business might be exposed, for example in respect of litigation or regulatory/public action; and

— It should be noted that while a working capital facility may be a useful tool for managing the mismatches of TNUoS and BSUoS charges, it cannot be used as a bridging facility to cope with other working capital requirements or losses associated with general business risks. This is because many of those losses may not be recoverable and hence a debt-based facility is neither likely to be made available nor is it the most efficient way to finance the business.

These financing requirements suggest that the financeability of the combined ESO business can be assessed based on a number of metrics.

Ensuring that the business has sufficient headroom above its operating cost base is an important indicator of the financeability of asset light businesses. This can be assessed based on a **profitability** metric in the form of a margin on the ESO's costs. Two main forms of margin could be considered as reasonable financeability metrics for the ESO: the first is a margin over the ESO's forecast internal operating costs (i.e., excluding the cost of funding TNUoS and BSUoS charges); and the second is a margin on total non-capital costs. Margin benchmarks for each are set out below.

The extent to which the business possesses sufficient equity capital to absorb potential losses on loan assets created as a consequence of funding TNUoS and BSUoS cash outflows is a relevant consideration. This can be assessed based on a **solvency** metric, defined as the ratio of equity to average risk-weighted assets – i.e., the average cumulative balance of funds dispersed to the TOs net of amounts recovered from system users.

The extent to which the business is able to draw upon liquid assets to cover short-term cash funding requirements is also important, noting that equity capital invested in fixed assets would not be immediately available to fund cash outlays. This can be assessed based on a **liquidity** metric, such as the ratio of cash and equivalents to forecast short-term cash funding requirements. In addition, it is necessary to consider scenarios for potential shocks involving significant cash outflows to consider whether the business would have sufficient resources with which to fund these expenditures.

It is also important to consider whether the business possesses sufficient equity capital to absorb losses on all assets possessed by the business before any adjustment for risk weighting is applied. This can be assessed based on a measure of **exposure**, defined as the ratio of total equity to total assets including, but not limited to, the average cumulative balance of funds dispersed to the TOs net of amounts recovered from system users. This represents a generalisation of the leverage metric to cover all potential exposures faced by the business.

Given that the ESO is likely to require some debt financing to fund investments in the RAV, it is necessary to include at least one interest cover metric as applied by credit rating agencies when assessing the creditworthiness of similar businesses. **Adjusted interest coverage** as employed by Moody's is one such metric. Given that debt financing is likely to pertain largely to RAV assets, the relevant threshold for this metric can be seen as similar to that applied to electricity TOs;

Credit rating agencies also consider **debt service coverage** alongside interest coverage when considering the creditworthiness of network utilities. For example, Moody's uses the ratio of Funds From Operations (FFO) to net debt as a key credit metric. This should also be considered when assessing the financeability of the ESO. Similarly to AICR, the relevant threshold for this metric can be seen as similar to that applied to electricity TOs;

The value of net debt to the RAV or **gearing** represents a complimentary metric to leverage. Credit rating agencies are likely to view the RAV as the principal source of collateral for debt financing, and hence will consider high levels of debt relative to the value of the RAV to be of concern from a creditworthiness perspective, notwithstanding that the RAV represents only one source of capital needed to fund the ESO's operations. The relevant threshold for this metric can be seen as similar to that applied to electricity TOs;

The above represent a set of metrics that is somewhat more extensive than is traditionally considered for network utilities. This is consistent with the complex nature of the ESO business, and the fact that it combines several business activities with markedly different characteristics. Each of these business activities creates different financing requirements for the combined entity, and these should be reflected in the overall financeability assessment.

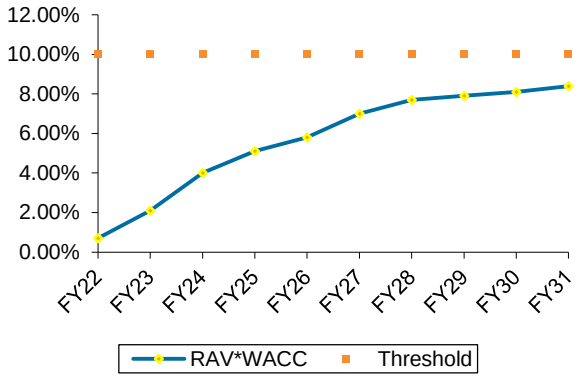
In principle, it is not a precondition of the financeability of the business that each of the constituent components of the business are financeable on a standalone basis. At the same time, if any individual component of the business breaches thresholds associated with particular financial metrics, the other business activities must exhibit proportionally stronger financial metrics in order for the business as a whole to be considered financeable. It may therefore be useful to consider the financeability metrics applicable to individual business activities alongside those for the combined entity as a cross-check on the overall assessment.

RAV*WACC approach

Profitability metrics

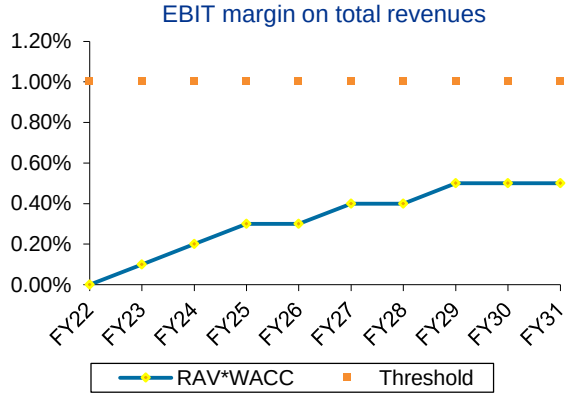
EBIT margin is often used as a measure of financial performance and financeability for similar, 'asset-light' companies. Moody's rating methodology for asset light businesses also includes efficiency and profitability metrics such as EBIT margin.

EBIT margins on controllable revenue



The EBIT margin based on controllable revenues indicates that the projected margins for NG ESO are tight and fall short of the required benchmarks per Moody's methodologies on asset-light businesses. This implies that under this model NG ESO is unable to meet profitability levels that would be expected by investors from a business of this type, given its business characteristics and risk exposure.

EBIT margin on total revenues

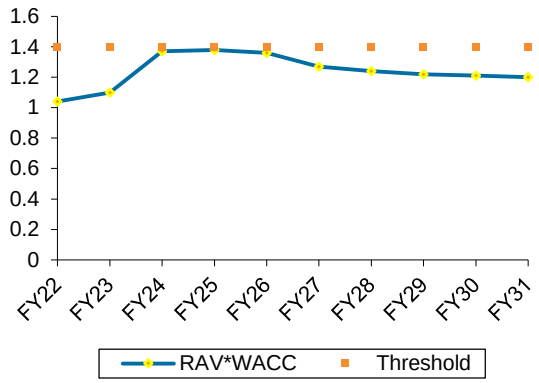


The margin analysis based on total revenues (which unlike a margin on controllable revenues is an estimate of total required profitability including pass-through costs) indicates that returns under the RAV*WACC are significantly below required profitability derived from pass-through cost benchmarks.

Overall, the EBIT margins are below the threshold and suggest that the operational headroom under this model is too small.

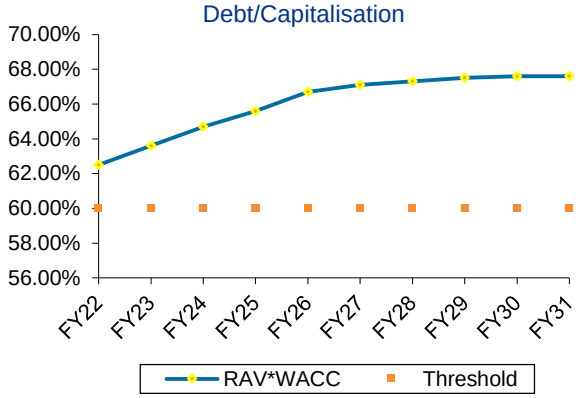
Debt Metrics

Adjusted Interest Cover Ratio



The AICR under this model even under the notional capital structure and assumptions is below the 1.4x target per Moody's methodologies for network utilities for much of RIIO2 and (given high operational gearing) is unlikely to imply sufficient financial headroom for NG ESO to manage the risks to which it is exposed.

Debt/Capitalisation



The assumption underpinning the notional structure, based on targeting 60% of RAV may not be a sustainable capital structure that can attract debt funding and could under state the additional contingent equity capital committed to the business but not called under this baseline case.

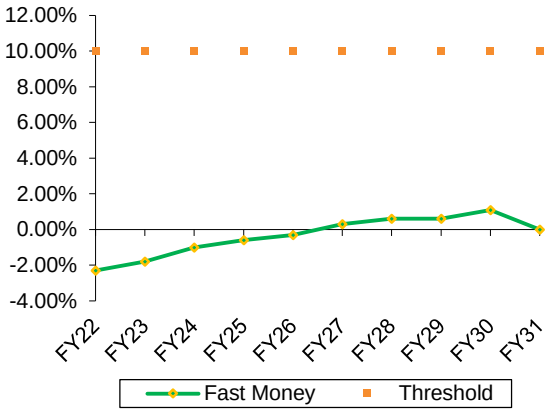
Equity metrics

The EBIT margins double up as the key metric of financial performance and financeability from an equity perspective. On this metrics this model does not resemble a financeable proposition given the business characteristics and risk exposure.

"Fast Money" approach

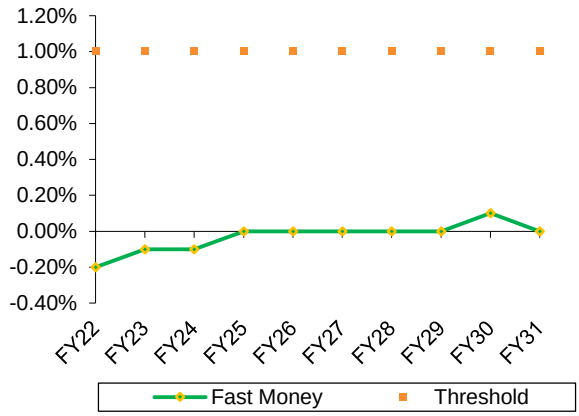
Profitability metrics

EBIT margins on controllable revenue



The EBIT margin based on controllable revenues indicates that the projected margins for NG ESO are tight and fall short of the required benchmarks. This implies that under this model NG ESO is unable to meet profitability levels that would be expected by investors from a business of this type, given its business characteristics and risk exposure.

EBIT margin on total revenues



The margin analysis based on total revenues (which unlike a margin on controllable revenues is an estimate of total required profitability including pass-through costs) indicates that returns under the "Fast Money" approach are significantly below required profitability.

Overall, EBIT margins (whether measured against total or controllable revenues) are below threshold and suggest that the operational headroom under this model is very thin.

Debt metrics

The fast money nature of this model coupled with the RAV depreciation results in an all-equity notional capital structure. Therefore, debt financeability is not considered further. However, having 100% equity may not be an appropriate capital structure and this needs to be considered separately to interpretation of credit metrics compared to rating agency thresholds.

Equity metrics

The EBIT margins double up as the key metric of financial performance and financeability from an equity perspective. On these metrics, this model does not resemble a financeable proposition given the business characteristics and risk exposure.

EBIT margins (against thresholds for controllable and total revenues) imply total profitability that is materially below levels that would be considered sufficient by investors for an asset-light business such as NG ESO. In RIIO3 where RAV is assumed to have fully depreciated there is almost no financial headroom available for the management of risk or return for capital committed to the business. In extremis, the "Fast Money" approach implies that NG ESO's business operations could be undertaken on a non-profit basis in the absence of tangible assets recognised in the RAV – because NG ESO as a business would earn no profits at all if it did not invest in physical assets.

Implications for the design of the overall regulatory approach for the ESO

This report has outlined the reasons why setting a level of remuneration that is in line with what commercial investors would expect from businesses being carried out in competitive market conditions is critical for the ESO and in the interest of system users and consumers.

Each business activity conducted by the ESO exhibits a funding requirement that cannot be fully satisfied through a RAV*WACC plus cost pass-through mechanism alone.

No business is viable unless it expects to earn a profit, regardless of whether or not it expects to recover its costs. The expectation of a normal profit provides the incentive to carry out and manage a business's activities on a day-to-day basis. In the case of the ESO, the treatment of costs as pass-through or otherwise is only consideration of the required level of remuneration. The most significant driver is the fact that the ESO, as a private agent, assumes responsibility for the smooth and effective operation of the transmission network, which entails significant exposures in relation to performance, delivery and operations on a day-to-day basis.

A further key challenge associated with the design of the regulatory regime for the ESO is to ensure that the approach will not overcompensate the ESO for the activities it undertakes. The approach considered in this report has addressed this challenge by determining the appropriate regulatory approach and level of remuneration for each activity separately. Aggregating these into a single package reduces the risk of overlaps – i.e., the same activity being remunerated twice rather than simply estimating them top-down as a single activity.

Given that the ESO is a complex, multi-faceted business, it is critical that the regulatory approach is appropriately tailored to the specific characteristics and risk exposures it faces in order to satisfy the assessment criteria set out previously. A regulatory approach that exclusively links the remuneration of the ESO to a single aspect of the business – such as its fixed assets or internal operating costs – is unlikely to be able to satisfy all of these criteria simultaneously, or strike an appropriate balance between them.

The appropriate regulatory framework for the ESO contrasts with the regulatory approach of network utilities, where the principal objective of the revenue approach is to encourage efficient investment in infrastructure delivery, and other considerations are of comparatively less importance. Under these circumstances, financial capital maintenance models that link profitability primarily to the scale of fixed assets in the RAV are more appropriate, and will generally provide adequate remuneration in total where the scale of the asset base is sufficiently large.

Even in these cases, baseline profitability is frequently supplemented with the use of incentive approaches that create the opportunity for greater profitability if the network is successful in driving operating cost efficiency or improved consumer outcomes. At the same time, the rewards available in these cases are typically limited by comparison with baseline allowed returns.

Instead, the regulatory approach for the ESO should link remuneration to a number of underlying drivers, corresponding to key risk drivers for the ESO or appropriate proxies:

A return should be provided on assets invested in the RAV, to ensure that the business continues to be rewarded for developing and maintaining the required infrastructure without being exposed to excessive stranding risk. The level of the return is still being consulted on by Ofgem and is subject to further development and updates. As such, an estimate of the appropriate allowed return is not provided in this report;

A margin should be provided on the ESO's forecast internal operating costs to provide it with sufficient headroom to manage working capital and liquidity requirements in respect of its day-to-day operations, as well as to manage exposures associated with material one-off events. In Sections 2 and 3, margins exhibited by market benchmarks were summarised for balancing and future services activities respectively.

A margin should be provided on the funds collected and dispersed by the ESO in respect of TNUoS and BSUoS charges on behalf of system users to reflect the costs and exposures associated with this activity. The appropriate margin for this activity should be based on relevant market benchmarks, candidates for which have been provided in Section 4 of this report.

The margin approach can be combined with an incentive regime, whereby the ESO would receive additional remuneration (or penalty) through rewards for outperformance (or underperformance) against pre-specified outcome targets and where it can add incremental value to consumers. However, this cannot be (and is not in a commercial setting) assumed to form part of the baseline expected remuneration required to meet financeability requirements.

While it is possible, in theory, to set incentive targets such that they can, on average, be expected to provide a positive payout and hence form part of baseline remuneration, this approach cannot ensure financeability. In order for this to meet the financeability of the ESO, it would be necessary for a number of criteria to be satisfied:

— The expected remuneration through the incentive package would – either on its own or together with a residual margin applied to costs – need to be the same in magnitude to the corresponding remuneration from the margins on costs set out ex-ante;

— The component of the incentive reward intended to supplant remuneration through a margin would need to be achievable based on the forecast performance against output targets set out within the ESO's business plan (i.e., not subject to outperformance against output targets);

— To the extent that the ESO is subject to downside penalties associated with under-delivery, this would need to be compensated for with additional remuneration beyond the amounts estimated under the margin-based approach above; and

— Investors would have to be able to transfer at least some of the risks associated with the above in order to secure baseline profitability.

In practice, this is difficult to implement robustly and in a manner that ensures the business expects to be remunerated in line with commercial benchmarks.

A regulatory approach that provides a clearly delineated form of remuneration such as set out earlier is the more appropriate form of remuneration in line with regulatory precedents compared with relying on a positively-skewed incentive mechanism.

Conclusions

The analysis and considerations outlined above also imply that neither of the two models recently suggested by Ofgem—RAV*WACC or all fast money—are aligned with what a commercial investor would require in order to take on and finance ESO's activities in a competitive market setting. This leads to the conclusion that these proposed approaches do not meet the criteria for simulating competitive market outcomes and would not ensue economic efficiency or maximise value to consumers.

A high level analysis of the financial projections of the ESO under these approaches also suggests that the ESO business is unlikely to meet the thresholds of a number of key financeability metrics.

The funding models proposed in the most recent consultation are therefore not appropriate for the characteristics of the ESO and would likely lead to sub-optimal outcomes. Instead, the analysis outlined in this report suggests that the appropriate funding model for the ESO combines a RAV*WACC approach with margins on forecast internal operating costs and external cashflows.