

RATING METHODOLOGY Regulated Electric and Gas Networks

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This rating methodology replaces "Regulated Electric and Gas Networks" last revised November 25, 2014. We have updated some outdated links and removed certain issuer-specific information.

Summary

This rating methodology explains Moody's approach to assessing credit risk for regulated electric and gas networks globally. It provides general guidance that helps companies, investors, and other interested market participants understand how qualitative and quantitative risk characteristics are likely to affect rating outcomes for companies in the regulated electric and gas networks industry. It does not include an exhaustive treatment of all factors that are reflected in Moody's ratings but should enable the reader to understand the qualitative considerations and financial information and ratios that are usually most important for ratings in this sector.¹

This report includes a detailed rating grid which is a reference tool that can be used to approximate credit profiles within the regulated electric and gas networks sector in most cases. The grid provides summarized guidance for the factors that are generally most important in assigning ratings to companies in the regulated electric and gas networks industry. However, the grid is a summary that does not include every rating consideration. The weights shown for each factor in the grid represent an approximation of their importance for rating decisions but actual importance may vary. In addition, the grid typically uses historical results while ratings are based on our forward-looking expectations. As a result, the grid-indicated rating is not expected to match the actual rating of each company.

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¹ This update may not be effective in some jurisdictions until certain requirements are met.

The grid contains five factors that are important in our assessment for ratings in the regulated electric and gas networks sector:

1. Regulatory Environment and Asset Ownership Model
2. Scale and Complexity of Capital Program
3. Financial Policy
4. Leverage and Coverage

The scoring for factors 1-4 results in a preliminary grid-indicated outcome. In addition, we apply the following factor 5, which can result in upward notching for issuers that benefit from structural enhancements, incorporated in their corporate structure, their regulatory license or their financing arrangements.

5. Structural Considerations and Sources of Rating Uplift From Creditor Protection

Some of these factors also encompass a number of sub-factors.

This rating methodology is not intended to be an exhaustive discussion of all factors that our analysts consider in assigning ratings in this sector. We note that our analysis for ratings in this sector covers factors that are common across all industries such as ownership, management, liquidity, corporate legal structure, governance and country related risks, which are not explained in detail in this document, as well as factors that can be meaningful on a company-specific basis. Our ratings consider these and other qualitative considerations that do not lend themselves to a transparent presentation in a grid format. The grid used for this methodology reflects a decision to favor a relatively simple and transparent presentation rather than a more complex grid that might map grid-indicated ratings more closely to actual ratings.

Highlights of this report include:

- » An overview of the rated universe
- » A summary of the rating methodology
- » A description of factors that drive rating quality
- » Comments on the rating methodology assumptions and limitations, including a discussion of rating considerations that are not included in the grid

The Appendices show the full grid (Appendix A), an explanation of how we calculate an adjusted interest coverage ratio (Appendix B), a brief discussion of our approach to networks within a corporate family (Appendix C), and a brief summary of industry issues over the medium term (Appendix D).

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

About the Rated Universe

The Regulated Electric and Gas Networks methodology is applicable to companies that are primarily engaged in the transmission and/or distribution of electricity and/or natural gas. They provide their services primarily to non-retail customers, and operate as monopolies within their service territory with tariffs regulated at the national/sovereign level. This methodology also applies to oil pipelines that are national monopoly businesses and subject to tariff regulation.

Transmission companies are engaged in the high-voltage/high-pressure transportation of electricity and gas while distribution companies are responsible for low-voltage/low-pressure transportation services. Issuers rated pursuant to this methodology predominantly own infrastructure assets with no significant ownership of upstream or downstream activities, e.g. electricity generation/gas production. While they may physically transmit electricity or gas to end-users on behalf of retail energy suppliers, regulated networks are generally not responsible for providing utility services to the final consumer. Instead, the customers of regulated networks are other energy companies, including retail energy suppliers, who procure electricity and gas on behalf of the end consumer and are themselves responsible for providing utility services, including billing and metering. As natural monopolies, the charges that networks can levy are determined by a regulatory authority at the national/sovereign level, with tariffs typically reviewed periodically.

While the majority of issuers rated pursuant to this methodology are financed on a corporate basis, this methodology also applies to some project-financed entities that are predominantly engaged in the ownership and operation of network infrastructure as many factors - including regulatory environment and the mechanisms for recovery of costs and investment are common across these corporate-financed and project-financed regulated networks.

This methodology excludes the following types of issuers, which are covered by separate rating methodologies: Regulated Electric and Gas Utilities (companies that are engaged in the transmission and/or distribution of electricity and/or natural gas but that also provide regulated utility services to a retail customer base, that in many cases also own regulated electricity generation assets, and that typically have a different type of regulatory framework), Unregulated Utilities and Power Companies, US Public Power Utilities (including US municipal utilities), US Electric Cooperatives, and Natural Gas Pipelines (companies that usually do not hold a monopoly franchise, could be subject to some competition, and whose revenues are determined primarily by commercial contracts, albeit with some regulatory oversight).

About this Rating Methodology

This report explains the rating methodology for electric and gas networks in several sections, which are summarized as follows:

1. Identification and Discussion of the Grid Factors

The grid in this rating methodology focuses on five rating factors. The first four grid factors are comprised of sub-factors that provide further detail. The fifth factor is used to make notching adjustments for structural enhancements where they are incorporated either in the company's regulatory license, its corporate structure or through its financial arrangements.

EXHIBIT 1

Regulated Electric and Gas Networks

Broad Grid Factors	Factor Weighting	Sub-Factors	Sub-Factor Weighting
Regulatory Environment and Asset Ownership Model	40%	Stability and Predictability of Regulatory Regime	15%
		Asset Ownership Model	5%
		Cost and Investment Recovery (Ability and Timeliness)	15%
		Revenue Risk	5%
Scale and Complexity of Capital Program	10%	Scale and Complexity of Capital Program	10%
Financial Policy	10%	Financial Policy	10%
Leverage and Coverage	40%	(FFO + Interest Expense - Non-Cash Accretion - Capital Charges) / (Interest Expense - Non-Cash Accretion) OR (FFO + Interest Expense) / Interest Expense	10%
		Net Debt / RAB OR Net Debt / Fixed Assets	12.5%
		FFO / Net Debt	12.5%
		RCF / Net Debt	5%
Total	100%		100%

Factor 5 – Structural Considerations and Sources of Rating Uplift From Creditor Protection – is a notching adjustment to the preliminary grid-indicated rating that results from Factors 1-4.

2. Measurement or Estimation of Factors in the Grid

We explain our general approach for scoring each grid factor and show the weights used in the grid. We also provide a rationale for why each of these grid components is meaningful as a credit indicator. The information used in assessing the sub-factors is generally found in or calculated from information in company financial statements, derived from other observations or estimated by Moody's analysts.

Our ratings are forward-looking and reflect our expectations for future financial and operating performance. However, historical results are helpful in understanding patterns and trends of a company's performance as well as for peer comparisons. In this case we typically utilize historical data (in most cases, an average of the last three years of reported results). All of the quantitative credit metrics incorporate Moody's standard adjustments to income statement, cash flow statement and balance sheet amounts for restructuring, impairment, off-balance sheet accounts, receivable securitization programs, under-funded pension

obligations, and recurring operating leases.² However, the factors in the grid can be assessed using various time periods. Rating committees typically assess both historical and expected future performance for periods of several years.

3. Mapping Grid Factors to the Rating Categories

After estimating or calculating each sub-factor, the outcomes for each of the sub-factors are mapped to a broad Moody's rating category (Aaa, Aa, A, Baa, Ba, B or Caa).

4. Assumptions, Limitations and Rating Considerations Not Included in the Grid

This section discusses limitations in the use of the grid to map against actual ratings, some of the additional factors that are not included in the grid but can be important in determining ratings, and limitations and assumptions that pertain to the overall rating methodology.

5. Determining the Overall Grid-Indicated Rating³

To determine the overall grid-indicated rating before notching considerations, we convert each of the sub-factor scores into a numerical value based upon the scale below.

EXHIBIT 2

Sub-factor score to numeric value

Aaa	Aa	A	Baa	Ba	B	Caa
1	3	6	9	12	15	18

The sub-factor weightings are modified by applying a further weighting by rating category as shown in the table below.

EXHIBIT 3

Over-weighting of certain sub-factor scores

Aaa	Aa	A	Baa	Ba	B	Caa
1	1	1	1.15	2	3	5

We weight lower rating scores more heavily than higher scores in the grid because a serious weakness in one area often cannot be completely offset by strength in another. For example, the lack of flexibility normally associated with a high degree of leverage can increase risk more than would be reflected without the additional weighting for a low grade score on this measure.

The actual weighting applied to each sub-factor is the product of that sub-factor's standard weighting and its over-weighting, divided by the sum of these products for all the sub-factors (an adjustment that brings the sum of all the sub-factor weightings back to 100%).

² See "Financial Statement Adjustments in the Analysis of Non-Financial Corporations". A link to this and other sector and cross-sector credit rating methodologies can be found in the Related Research section of this report.

³ In general, the grid-indicated rating is oriented to the Corporate Family Rating (CFR) for speculative-grade issuers and the senior unsecured rating for investment-grade issuers. For issuers that benefit from ratings uplift due to parental support, government ownership or other institutional support, the grid-indicated rating is oriented to the baseline credit assessment. For an explanation of baseline credit assessment, please refer to our rating methodology on government-related issuers. Individual debt instrument ratings also factor in decisions on notching for seniority level and collateral. The documents that provide broad guidance for these notching decisions are our rating methodologies on loss given default for speculative grade non-financial companies and for aligning corporate instrument ratings based on differences in security and priority of claim. The link to these and other cross-sector methodologies can be found in the Related Research section of this report.

The numerical score for each sub-factor is multiplied by the adjusted weight for that sub-factor with the results then summed to produce a composite weighted-factor score. The composite weighted-factor score is then mapped back to an alphanumeric rating based on the ranges in the table below.

EXHIBIT 4

Grid-Indicated rating

Grid-Indicated Rating	Aggregate Weighted Total Factor Score
Aaa	$x < 1.5$
Aa1	$1.5 \leq x < 2.5$
Aa2	$2.5 \leq x < 3.5$
Aa3	$3.5 \leq x < 4.5$
A1	$4.5 \leq x < 5.5$
A2	$5.5 \leq x < 6.5$
A3	$6.5 \leq x < 7.5$
Baa1	$7.5 \leq x < 8.5$
Baa2	$8.5 \leq x < 9.5$
Baa3	$9.5 \leq x < 10.5$
Ba1	$10.5 \leq x < 11.5$
Ba2	$11.5 \leq x < 12.5$
Ba3	$12.5 \leq x < 13.5$
B1	$13.5 \leq x < 14.5$
B2	$14.5 \leq x < 15.5$
B3	$15.5 \leq x < 16.5$
Caa1	$16.5 \leq x < 17.5$
Caa2	$17.5 \leq x < 18.5$
Caa3	$18.5 \leq x < 19.5$

For example, an issuer with a composite weighted factor score of 11.7 would have a Ba2 preliminary grid-indicated rating.

We apply a fifth factor called “Structural Considerations and Sources of Rating Uplift From Creditor Protection” to the preliminary grid-indicated rating score that results from factors 1-4, in order to arrive at a final grid-indicated rating. Factor 5 can result in upward adjustment of the grid-indicated rating due to structural enhancements that are incorporated in the company’s regulatory license, its corporate structure, or through its financial arrangements. How we assess the effectiveness of any such enhancements to determine the appropriate uplift is described in the section “Structural Considerations and Sources of Rating Uplift From Creditor Protection”.

7. Appendices

The Appendices provide a presentation of the full grid and additional commentary and insights on our view of credit risks in this industry.

Discussion of the Grid Factors

The grid for regulated electric and gas networks focuses on four broad factors:

1. Regulatory Environment and Asset Ownership Model
2. Size and Complexity of Capital Program
3. Financial Policy
4. Leverage and Coverage

There is also a fifth factor: "Structural Considerations and Sources of Rating Uplift From Creditor Protection", which is scored as a notching adjustment to the preliminary grid-indicated rating score that results from the combination of the four factors above.

Factor 1: Regulatory Environment and Asset Ownership Model (40% Weight)

Why It Matters

As monopoly providers of essential transmission and distribution services, electric and gas networks rated pursuant to this methodology are regulated, i.e. their revenues (or tariffs) are subject to price control limits that are typically reset periodically. Price-setting mechanisms are generally structured to limit volatility and tend to be highly predictable. In addition to price-setting, there are a number of ways that regulatory decisions can affect a network's business position, including a regulator's ability to agree on a capital expenditure program or to set efficiency targets to reduce operating costs. Finally, the ability to recover prudently-incurred costs in a timely manner is one of the most important credit considerations for regulated electric and gas networks, as a delay in cost recovery may cause financial stress. Therefore, the predictability and supportiveness of the regulatory framework in which a network operates – as well as the legal and political framework that underpins it – is a key credit consideration and the one that differentiates this sector from most other corporate sectors.

The asset ownership model of one network can be significantly different from other networks serving similar regions (in terms of size or population) elsewhere in the world. Indeed, the nature of the ownership and/or exploitation rights of the network can vary from full ownership and control of all key assets, through some form of concession arrangement, to a short-term lease or license arrangement that is capable of being terminated relatively easily by the regulator or the licensing authority, hence giving only a short period of time to enjoy the revenue earning capacity of the network. This risk may be further elevated in jurisdictions where there is an increased likelihood of expropriation or where the laws detailing property rights are weaker or less established. The ability of a company to sell, if necessary, its network without constraint is also a key consideration and allows substantial operational and capital flexibility. This is most easily achieved where assets are owned outright in jurisdictions with strong property rights. Therefore, the type of asset ownership arrangement will drive the business flexibility of an issuer.

To assess this factor, we examine the following four sub-factors:

- » Stability and Predictability of Regulatory Regime
- » Asset Ownership Model
- » Cost and Investment Recovery (Ability and Timeliness)
- » Revenue Risk

How We Assess Stability and Predictability of Regulatory Regime for the Grid

We consider the characteristics of the regulatory environment in which a network operates. These include how developed and transparent the regulatory framework is; the strength of the political and legal underpinnings of the regulatory framework; the regulator's track record for predictability and stability in terms of decision making; its independence from political interference; and our forward looking view on whether these conditions will continue to persist. In addition, this sub-factor also considers the effectiveness of the independent body or legal system that can arbitrate disputes between a regulator and a regulated company in a timely fashion.

A network operating in a stable, reliable and highly predictable regulatory environment will be scored highly; those networks operating in a less developed regulatory framework or one that is characterized by a high degree of political intervention in the regulatory process will receive much lower scores for this factor. Nevertheless, changes to the regulatory framework or to existing utility law do occur, although the way that this is achieved can vary significantly. Where regulatory or legislative changes do occur, networks can still have a high score on this sub-factor if there was sufficient consultation with the affected companies during the process and the changes are supportive of networks' credit quality. In contrast, networks will have a low score on this factor if changes to the regulatory framework have been implemented without consultation, are unclear, or are detrimental to credit quality.

How We Assess Asset Ownership Model for the Grid

In those cases where network assets are not owned outright by the rated entity, we consider the risk that a license or concession may be terminated. We also consider whether the right to exploit the network assets effectively may be short-to-medium term and therefore transitory in nature. It is common practice throughout the world that the ownership of what are, in many cases, assets of national importance is subject to a license, and this would be considered the usual arrangement. It is less common to see private sector companies own assets outright in perpetuity, although this ownership model may be seen in certain countries or in cases where alternative transportation systems exist (e.g. transit pipeline, interconnector, etc).

A company that owns all key network assets outright in perpetuity and has control over them would have a high score under this factor, and a company that held its key assets under a short-term operating lease or license type arrangement would have a low score. Issuers with concession agreements or more permanent licenses would score somewhere in the middle of the grid depending on (i) the nature of events that could cause a loss of concession or license, (ii) the timeframe thereof, and (iii) the entitlement to compensation upon termination.

We also consider the general rule of law and the value and enforcement of asset property rights. In order to score 'A' and above, unless there are mitigating factors such as government ownership, networks are expected to operate in jurisdictions where there is no perceived risk of expropriation and where the laws pertaining to property rights are well established, thereby reducing the risk for creditors. For example, if there is a heightened risk of expropriation of assets in this sector with limited potential for compensation, we would score a company at a lower level even if it currently owns its assets outright.

How We Assess Cost and Investment Recovery for the Grid

This sub-factor focuses on the supportiveness of the regulatory framework, i.e. the extent to which the regulatory formula is supportive of cost recovery, including the mechanism by which one-off costs or over-spends are recovered, if at all. In other words, it focuses on the risk allocation between the network operator and its customers. Prevalent regulatory models for unbundled networks across the world are "ex-ante", "ex-post" or "cost-plus". While in theory ex-ante regulation provides the greatest certainty for the recovery of capital investment, each type of regulatory model may have greater or lesser predictability in cost recovery depending on the details of the framework and the manner in which it is applied by regulators.

We assess whether the regulator seeks to insulate consumers from the volatility and the uncertainty associated with operating and financial costs, whether there is risk-sharing between the network and its consumers, and whether the network easily is able to pass through its incurred costs, including financial costs. A network that has complete flexibility to set tariffs so that it can meet current and future operating and capital costs without impediment likely will have a high score under this sub-factor. A network that benefits from fair and timely cost and investment recovery but is subject to efficiency targets or high regulatory scrutiny would likely score in the middle of the grid. Where there is a significant deferral of allowed revenue, e.g. for a greenfield development where the current number of customers is very low but expected to grow, or where a company has been significantly over-spending on its investments, a low score on this sub-factor likely would apply.

How We Assess Revenue Risk for the Grid

In this sub-factor we consider the ability of a network to generate the revenue allowed to it by the regulator. In general, the revenues achieved by networks can vary from this pre-determined level due to differences in consumed volumes from that forecast when charges were initially set. However, the extent to which networks are affected by volume risk depends on the structure of the regulatory charge, which can include both a fixed and a variable element. The greater the proportion of the end-user charge that is fixed, the lower the potential revenue variability.

As a general rule, we believe that gas and electricity transmission tends to be less volatile than distribution due to its wider geographic outreach (e.g. volumes are arguably more stable and predictable where exposed to a country's entire economy vs. a subset thereof). From a commodity perspective, gas volumes are likely to be more exposed to weather conditions than electricity volumes, given the role of gas as a heating fuel source in many jurisdictions. However, there may be ultimately no direct link between volume volatility and revenue generation as some regulators may de-couple the two, given that volumes are outside of a network company's control. Furthermore, regulators do not typically wish to incentivize networks to distribute more energy, which would run contrary to the principles of energy efficiency. If so, the regulator may choose to eliminate volume risk entirely (by setting a fully fixed charge for transmission and distribution activities) or may allow a true-up mechanism that allows networks to reset their charges in a timely fashion to recover any lost revenue.

Issuers will likely score more highly on this sub-factor if their revenues are entirely de-linked from volumes transported. Networks will likely score in the middle of the grid if they have some exposure to volume risk but benefit from a regulatory formula that allows for the recovery of any lost revenue. In contrast, networks that have high exposure to volumes or where volumes are expected to be particularly volatile would likely have a low score on this sub-factor. We will also take into account a network's reliance on revenues associated with new connections. While the costs incurred in connecting new customers are normally a pass-through under most developed regulatory frameworks, such activity may generate significant cash flows if the network is allowed to make a margin, thereby raising the overall volatility of the business.

Factor 1: Regulatory Environment and Asset Ownership Model (40% Weight)

Sub-factor	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Stability and Predictability of Regulatory Regime	15%	Regulation is independent, well established (> 15 years of being predictable and stable) and transparent (well-established regulatory principles clearly define risk allocation between companies and customers and are consistently applied, with public or shared financial models). These conditions are expected to continue.	Regulation is independent, well established (> 10 years of being predictable and stable) and transparent (well-established regulatory principles clearly define risk allocation between companies and customers and are generally consistently applied). These conditions are expected to continue.	Regulation is generally independent and developed (regulatory principles define risk allocation between companies and customers and are based on established precedents in the same jurisdiction). These conditions are expected to continue.	Regulatory framework is relatively new and untested, although regulatory principles are based on established precedents. Jurisdiction has a history of independent and transparent regulation for other utility services. These conditions are expected to continue.	Regulatory framework is defined but not consistently applied; tariff setting is subject to negotiation and political interference; some precedents in the country of predictable regulation for other utility services. These conditions are expected to continue.	Regulatory framework is unclear, untested or undergoing significant change, with a history of political interference. These conditions are expected to continue.	Regulatory framework is not defined, is unpredictable or politically driven with significant adverse consequences for the utility. These conditions are expected to continue.

Factor 1: Regulatory Environment and Asset Ownership Model (40% Weight)

Sub-factor	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Asset Ownership Model	5%	All key T&D assets held outright in perpetuity AND no risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held outright under licence which can be terminated for underperformance, failure to meet certain financial parameters or insolvency OR held under long term concession with clearly defined right to timely recovery of residual asset value at termination/end of concession underpinned by highly rated entity AND no risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held under long-term concession with clearly defined right to recover value of residual assets at termination/end of concession underpinned by highly rated entity but with undefined timeframe OR held under medium/long-term operating leases or management contracts with very substantial portfolio diversification, very established market position and very high renewal rate (>95%) AND no risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held under long-term concession with some entitlement to recover value of residual assets at termination/end of concession but procedures untested/undefined OR held under medium-term operating leases or management contracts with substantial portfolio diversification, established market position and high renewal rate (>90%) AND/OR jurisdiction has reasonably strong property rights although there is some, albeit low risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held under concession with recovery of residual asset value at termination/end of concession subject to negotiation OR held under short-term operating leases or management contracts with good degree of portfolio diversification and renewal rate (>80%) AND/OR jurisdiction may have some laws detailing property rights although these may be untested. A change of ownership would likely result in a loss for creditors.	Key T&D assets held under short-term operating leases or management contracts (limited portfolio diversification) with limited clarity on renewal and/or compensation AND/OR probability of termination/expropriation is elevated. Compensation likely to be minimal and could be subject to significant delays in payment.	Company is in default of its licence, concession or lease/contract and is likely to lead to termination AND/OR expropriation very likely, no prospect of compensation.

Factor 1: Regulatory Environment and Asset Ownership Model (40% Weight)

Sub-factor	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Cost and Investment Recovery (Ability and Timeliness)	15%	No regulatory or contractual impediment to adjust tariffs (no approval or reviews required).	Tariff formula is expected to allow for timely recovery of operating expenditure including depreciation, electricity losses and balancing costs/shrinkage gas and a fair return on all investment. All capital expenditure is included in asset base as incurred. Unanticipated expenditure quickly reflected in allowed revenue with low, if any, efficiency assessment.	Tariff formula is expected to allow for recovery of operating expenditure including depreciation based on allowances set at frequent price reviews (5-yearly intervals or shorter) and a fair return on all efficient investment. Capital expenditure is included in asset base as incurred. Opex and capex subject to efficiency tests; electricity losses and balancing costs/shrinkage gas subject to efficiency test on volumes only (price is a pass through). Unanticipated expenditure generally quickly reflected in allowed revenue although this may not be until the following regulatory period and may be subject to a degree of regulatory scrutiny or sharing factor with customers. Performance is likely to be in line with regulatory expectations.	Tariff formula is expected to allow for recovery of operating expenditure including depreciation and return on investment but subject to retrospective regulatory approval or infrequent price reviews (> 5-yearly intervals); recovery of electricity losses and balancing costs/shrinkage gas is somewhat exposed to price. Some instances of revenue backloading expected (e.g. depreciation allowance set below asset consumption or operating expenditure is capitalized). Unanticipated expenditure slow to be reflected in allowed revenue or may be subject to a stringent efficiency assessment/low sharing factor. Performance may be below regulatory expectations.	Tariff formula is not expected to take into account all cost components and depreciation is set below asset consumption; recovery of electricity losses and balancing costs/shrinkage gas has large exposure to price. Revenues expected to cover most operating expenditure but investment is not clearly or fairly remunerated. Overspend either not recognized in allowed revenue or there is high uncertainty about its future recognition. Operational underperformance likely to be significantly impacting the returns achieved by the business.	Tariff formula is not expected to take into account all cost components and depreciation is set below asset consumption; recovery of electricity losses and balancing costs/shrinkage gas is fully exposed to price. Revenues expected to cover cash operating expenditure.	Revenues expected to only partially cover cash operating costs.
Revenue Risk	5%	No exposure to volume risk. Collected revenues based on capacity charges.	Very low exposure to volume risk. Collected revenues based on volume charges with stable volumes expected. Revenue cap mechanism with timely recovery in place.	Limited exposure to volume risk. Collected revenues based on volume charges with some volatility in volumes expected. Revenue cap mechanism in place; OR Hybrid price/revenue cap with low volatility in volumes.	Moderate exposure to volume risk. Hybrid price/revenue cap with moderate volatility in volumes; OR Some reliance on connection revenues.	Material exposure to volume risk: price cap with significant volatility in volumes; OR Material reliance on connection revenues.	High exposure to volume risk: price cap with substantial volatility in volumes; OR Very high reliance on connection revenues.	Very high exposure to volume risk: price cap with high concentration of volumes to one particular customer or sector; OR Revenues mainly driven by connections.

Factor 2: Scale and Complexity of Capital Program (10% Weight)

Why It Matters

Factor 2 considers a network's investment plan and the associated execution risk. Given the global trend of population growth, renewable generation deployment and decarbonization requirements, the emergence of new energy technologies (such as smart grids and electric cars), many networks have large and ongoing capital investment programs.

Many companies also have substantial needs for replacement of grids that are ageing, or for improvement of their reliability. For most networks, a sizeable capital expenditure program is thus a constant feature of their business model. While networks are generally experienced in large construction programs, they nonetheless introduce execution risk to the enterprise. The program may take longer than envisaged or could cost more. Furthermore, such cost overruns may not be recoverable from future revenues or may be subject to an efficiency review by the regulator. In addition to the direct financial impact, a large or complex capital program may prove a distraction for the management of a network, which could lead to an under-performance in other areas of the business.

How We Assess Scale and Complexity of Capital Program for the Grid

Moody's makes an assessment of a regulated network's capital expenditure program by considering (i) its size and scope, (ii) the complexity of this capex program, i.e. the type of assets to be built and associated technical issues as well as the relative concentration of challenging projects within the issuer's total capex program, (iii) management's ability to deliver the plan without material cost over-runs, and (iv) whether the program will introduce financing challenges.

To some extent, the size of a network's capital expenditure plans can be correlated to the complexity of the program, particularly for material capacity increases or technically challenging projects. Thus, we consider the size of the total annual capex plan as percentage of its Regulatory Asset Base or its total fixed assets. However, this percentage may not directly correlate to risk in all scenarios. For example, replacement programs that are large in scope may nevertheless present only limited execution risk, for example the laying of polyethylene gas pipe. Here the technology is simple and well-established. A large capital expenditure program could also reflect a significant number of individual projects where overall execution risk is reduced through diversification.

As a result, a network undertaking a relatively small investment program but one which is specific and/or complex will likely have a score lower than a network involved in a number of small and simple projects. For this sub-factor we consider total capital expenditure, including those outside of the core regulated activity. Although such activities would generally not directly prejudice the network operations, material investments outside of the core regulated business may impair debt service or cause a significant drain on management's time and resources.

Issuers with large, modern asset bases requiring a limited amount of simple maintenance (with capital expenditure representing a low percentage of fixed assets) will likely have very high scores for this sub-factor. In contrast, networks that need to modernize their systems and must engage in complex, concentrated programs that are challenging to finance (and where annual capex represents a high percentage of fixed assets) will likely have very low scores for this factor.

Factor 2: Scale and Complexity of Capital Program (10% Weight)

Sub-factor	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Scale and Complexity of Capital Program	10%	Capex program is extremely limited in scale, reflecting a modern, highly developed asset base that requires only simple maintenance expenditure (e.g. total annual capex is < 4% of total fixed assets or regulated asset base).	Capex program is limited in scale, reflecting a well developed asset base that requires only maintenance expenditure (e.g. total annual capex is 4-6% of total fixed assets or regulated asset base).	Capex program is modest in size, reflecting a well developed asset base. Expenditure primarily relates to maintenance although some projects may be larger (e.g. total annual capex is 6-8% of total fixed assets or regulated asset base) or more complicated.	Capex program is manageable in size (e.g. total annual capex is 8-12% of total fixed assets or regulated asset base) or is generally straightforward (expenditure consists of a replacement plus a number of development projects albeit with limited execution risk).	Capex program is large in size (e.g. total annual capex is 12-20% of total fixed assets or regulated asset base) or is challenging in scope (small number of large and complex development projects account for the majority of capital expenditure and carry a degree of execution risk). Obligation to invest poses a financing challenge.	Capex program is very large in size (e.g. total annual capex is 20-30% of total fixed assets or regulated asset base) or highly complex in scope (one large or complex project accounts for majority of expenditure and carries a high execution risk). Capex obligation likely to pose a significant financing challenge.	Capex program is extremely large in size (e.g. total annual capex is ≥ 30% total fixed assets or regulated asset base) or is highly technically complex (one or more large projects account for the majority of expenditure and together carry a very high execution risk). Capex obligation likely to undermine the ongoing financial stability of the company.

Factor 3: Financial Policy (10% Weight)

Why It Matters

Management and board tolerance for financial risk is an important rating factor as it directly affects debt levels, credit quality and risk in the capital structure (e.g., refinancing risk, counterparty risk or exposure to interest rates or foreign exchange movements).

The generally stable and predictable cash flows of a regulated network create significant capacity to incur debt financing and potentially to invest in related businesses. While debt financing may be considered essential to the efficient capital structure of a network, a desire to enhance shareholder returns may lead to the pursuit of higher leverage, which increases credit risk. The way in which a network owner uses its debt capacity, therefore, is a key rating consideration.

In this factor we assess the likelihood that financial policy decisions, in their totality, could add uncertainty to future cash flow levels and divert resources away from creditors. In this regard, management's track record and their public commitment to maintaining the issuer's credit quality are key considerations.

How We Assess Financial Policy for the Grid

In this factor, we consider the company's approach to financing its activities, in particular the balance it strikes in apportioning risk between shareholders and creditors. We assess both the company's historical track record and its stated objectives with respect to leverage and financing decisions, as well as the investment return requirements of its owners. The behavior of owners can be a key differentiating credit consideration – where owners' objectives are short-term, opaque or where there is a lack of track record, the regulated network will likely be scored lower than if its shareholders have more long-term return requirements and may be willing to forego near-term distributions to maintain flexibility.

Issuers are likely to have a high score on this factor if they have an extended track record of low levels of leverage plus a public commitment to maintaining high levels of credit quality. A network that employs an average level of leverage for the industry (e.g. to a level implied within the regulator's allowed rate return) and that has a solid record of commitment to maintaining its targeted financial metrics is likely to be scored in the middle of the range. However, scores of "Baa" and above generally would apply only where there are no (or only very limited) concerns regarding owners' behavior – e.g. listed companies, government majority owned companies or those owned by industrial shareholders. Issuers with consistently higher levels of leverage or those with a less transparent financial policy would likely score "Ba" or lower on this factor.

This factor is scored separately from a notching factor for specific structural enhancements that provide additional creditor protection (Factor 5). However, where they exist, such enhancements will be considered to the extent they define or clarify the issuer's overall financial policy.

Factor 3: Financial Policy (10% Weight)

Sub-factor	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Financial Policy	10%	Long track record and expected maintenance of extremely conservative financial policy; very stable metrics; low debt levels for the industry; AND Public commitment to the highest credit quality over the long-term.	Long track record and expected maintenance of a conservative financial policy; stable metrics; lower than average debt levels for the industry; AND Public commitment to a very high credit quality over the long-term.	Extended track record and expected maintenance of a conservative financial policy; moderate debt leverage and a balance between shareholders and creditors; Not likely to increase shareholder distributions and/or make acquisitions which could lead to a weaker credit profile; Solid commitment to high credit quality.	Track record and expected maintenance of a conservative financial policy; an average level of debt for the industry and a balance between shareholders and creditors; Some risk that shareholder distributions and/or acquisitions could lead to a weaker credit profile; Solid commitment to targeted metrics.	Track record or expectation of maintenance of a financial policy that is likely to favor shareholders over creditors; higher than average, but not excessive, level of leverage; Owners are likely to focus on extracting distributions and acquisitions but not at the expense of financial stability.	Track record of aggressive financial policies or expected to have a financial policy that favors shareholders through high levels of leverage with only a modest cushion for creditors; OR High financial risk resulting from shareholder distributions or acquisitions.	Expected to have a financial policy unfavorable to creditors with a track record of or expected policy of maintaining excessively high debt leverage; OR Elevated risk of debt restructuring.

Factor 4: Leverage and Coverage (40% Weight)

Why It Matters

The first three rating factors aim to capture the credit strengths and weaknesses afforded by the network's fundamental business and its financial policies. However, a company's ultimate credit profile must also incorporate its financial metrics, because a network that is substantially weaker than its peers in terms of cash flow generated or debt relative to the value of its asset base will generally have a higher probability of default.

When examining leverage and coverage, there is no single measure that can predict the likelihood of default. We utilize metrics that measure both the absolute capacity of the issuer to service its debt and the size of its debt burden relative to those of its peers. Leverage ratios aim to capture different measures of how easily an issuer can repay its debt; coverage ratios focus more on the ability to service the debt prior to repayment but also need to take into account the peculiarities of different regulatory frameworks.

To score this factor in the grid, we examine four financial metrics:

- » Adjusted Interest Coverage Ratio ("Adjusted ICR") or FFO Interest Coverage
- » Net Debt / Regulatory Asset Base ("RAB") or Net Debt / Fixed Assets
- » FFO / Net Debt
- » RCF / Net Debt

How We Assess Interest Coverage for the Grid

Interest coverage is used as an indicator of a regulated network's ability to cover the cost of its debt. Depending on the regulation type and the level of publicly available information, we will calculate the interest coverage ratio (ICR) in one of two ways.

The adjusted ICR is our preferred metric for networks where allowed revenues/tariffs are determined using a 'building block approach' and where the components of allowed revenues/tariffs are routinely published and can be verified by an independent source, which in most cases is the regulatory authority itself. Components of the revenue building block analysis include: the total amount of operating and capital expenditure, the portion of the RAB/asset base that provides for a return of capital (known as regulatory depreciation) and any other adjustments that can change the timing of cost recovery. This information is necessary as the adjusted ICR seeks to normalize for different regulatory approaches to the capitalization and depreciation of networks' expenditure, which affects the timing of their cash flow. The adjusted ICR therefore adjusts funds from operations (FFO) by an amount of money (Capital Charges) that the regulator provides as current revenues at the expense or benefit of future revenues. Capital Charges include elements such as regulatory depreciation, the timing of cost recovery (the so called 'speed of money') or a profiling of the company's revenues over a regulatory period resulting in a potential volatility that we seek to adjust. Further information can be found in Appendix B.

The formula for the Adjusted ICR is as follows:

$$\frac{\text{FFO} + \text{Interest Expense} - \text{Non-Cash Accretion} - \text{Capital Charges}}{\text{Interest Expense} - \text{Non-Cash Accretion}}$$

For regulated networks that utilize unconventional debt funding, such as zero-coupon, capital accretion, index-linked bonds or swap arrangements, we seek to make the appropriate adjustments to the ratio calculations to improve consistency and comparability to the peer portfolio.

In jurisdictions where regulatory revenues/tariffs are not determined with a 'building block approach' or where the regulatory information needed to calculate Capital Charges may not be consistently available, publicly or otherwise, the ICR is calculated as $(\text{FFO} + \text{Interest Expense}) / \text{Interest Expense}$.

How We Assess Net Debt / RAB or Net Debt / Fixed Assets for the Grid

Typically, the Net Debt / RAB ratio is preferred for regulated networks, especially where the RAB serves as a proxy for the long-term average enterprise value of a regulated business. The RAB is analogous to the Rate Base in the US albeit with some differences. In this methodology we use the term RAB throughout.

Under some regulatory regimes, however, RAB may not accurately represent the invested capital on which the network will earn a return over time (e.g. because of ex-post rate-setting), or it may not be publicly available. In these circumstances we typically utilize Net Debt / Fixed Assets. For example, a network may be allowed to earn a return on construction-work-in-progress, but it will not be part of RAB until the asset is completed. Alternatively, a regulator may designate certain assets (for example receivables, deferred charges or regulatory assets) to be outside of RAB but permit the network to earn a regulated return on them.

For this ratio and those that follow, net debt is calculated as total debt less unrestricted cash.

How We Assess FFO / Net Debt for the Grid

This ratio is one of Moody's most commonly used dynamic leverage measures to measure cash flow in comparison to its indebtedness. This ratio may be more useful in comparing the ability of a company (or a peer group of networks operating under similar regulatory financial models) to generate sufficient cash flow to cover future debt repayments than in comparing networks operating under very different regulatory financial models (see Appendix B). More specifically, a higher level of FFO / net debt may not be a sign of financial strength when it is driven by a higher level of regulatory depreciation. Nevertheless, in comparing two companies that maintain a similar net debt / RAB ratio over a period of time, a higher level of FFO / net debt is usually indicative of greater financial strength.

The numerator in this ratio is FFO, and the denominator is net debt.

How We Assess RCF / Net Debt for the Grid

This ratio is an indicator for financial leverage as well as an indicator of the strength of a network's cash flow after dividend payments are made. Dividend obligations of networks are often substantial, quasi-permanent outflows that can affect the ability of a network to cover its debt obligations, and this ratio can also provide insight into its financial policies. The higher the level of retained cash flow relative to a network's debt, the more cash it has to support its capital expenditure program. The numerator of this ratio is FFO minus dividends, and the denominator is net debt.

Factor 4: Leverage and Coverage (40% Weight)

Sub-factor	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Adjusted Interest Coverage Ratio: ⁴ (FFO + Interest Expense - Non-Cash Accretion ⁵ - Capital Charges) / (Interest Expense - Non-Cash Accretion)	10%	≥ 5.5x	3.5 - 5.5x	2 - 3.5x	1.4 - 2x	1.1 - 1.4x	0.9 - 1.1x	< 0.9x
OR		OR	OR	OR	OR	OR	OR	OR
FFO Interest Coverage: (FFO + Interest Expense) / Interest Expense		≥ 7.5x	5.5 - 7.5x	4 - 5.5x	2.8 - 4x	1.8 - 2.8x	1.1 - 1.8x	< 1.1x
Net Debt / RAB OR Net Debt / Fixed Assets ⁶	12.5%	< 30%	30 - 45%	45 - 60%	60 - 75%	75 - 90%	90 - 100%	≥ 100%
FFO / Net Debt ⁷	12.5%	≥ 35%	26 - 35%	18 - 26%	11 - 18%	5 - 11%	0 - 5%	< 0%
RCF / Net Debt ⁶	5%	≥ 30%	21 - 30%	14 - 21%	7 - 14%	1 - 7%	(4) - 1%	< (4)%

⁴ The adjusted ICR is our preferred metric for networks where allowed revenues/tariffs are determined using a 'building block approach' and where the components of allowed revenues/tariffs are routinely published and can be verified by an independent source, which in most cases is the regulatory authority itself. Required components of the revenue building block include: the total amount of allowed operating and capital expenditure, the portion of the RAB/asset base that provides for a return of capital (known as regulatory depreciation) and any other adjustments that can change the timing of cost recovery. For regulated networks that utilize unconventional debt funding, such as zero-coupon, capital accretion, index-linked bonds or swap arrangements, we seek to make the appropriate adjustments to the ratio calculations to improve consistency and comparability to the peer portfolio. Please see Appendix B for a discussion of Capital Charges and some illustrative example of this ratio.

For other regulated networks, the FFO Interest Coverage Ratio is used.

⁵ For clarity, Non-Cash Accretion is deducted in the numerator only to the extent it has been added to FFO, and it is deducted from the denominator only to the extent that it has been included in Interest Expense.

⁶ Net Debt / Regulatory Asset Base (RAB) is the preferred ratio where RAB is publicly available and when it represents the invested capital on which the network earns a return. Net Debt / Fixed assets is used in all other cases. Net Debt is total debt minus unrestricted cash. When Net Debt is negative, the score for this sub-factor is Aaa.

⁷ For FFO / Net Debt and RCF / Net Debt, when Net Debt is negative and the numerator is a positive number (thus, a negative ratio), the score is Aaa. When Net Debt is negative and the numerator is a negative number (thus, a positive ratio), the score is B.

Factor 5: Structural Considerations and Sources of Rating Uplift From Creditor Protection

Why It Matters

Electric and gas networks may be financed using a range of different techniques. The simplest form is arguably a lowly leveraged, unsecured debt structure with few, if any, restrictive covenants. In contrast, some networks are very highly leveraged but operate within the confines of a tightly covenanted financial structure that significantly restricts their flexibility in a manner that is generally beneficial to debt holders. Indeed, in the recent past, many electric and gas networks have increased their leverage following changes in their ownership with large, vertically integrated utilities reducing their ownership in favor of specialist investment funds. These funds can also vary significantly in their complexity, ranging from traditional private equity owners with a relatively short-term return requirement to an open-ended and long-duration infrastructure fund backed by pension funds.

In response to the emergence of new owners, higher leverage and a somewhat shorter track record of financial policy, debt investors have increasingly sought additional credit protection mechanisms more akin to those in project financing.

We believe that structural enhancements may provide valuable protection to financial creditors in the regulated electric and gas network sector, and this can result in rating uplift. Such enhancements may be incorporated into the terms and conditions of financing agreements pertaining to essentially all of a network's securities holders, or they may be a feature within the networks' regulatory license, and include requirements such as maintaining a certain credit rating and demonstrating sufficient operating and financial resources (as is the case in the United Kingdom).

How We Assess It for the Grid

Our determination of the degree of ratings uplift that debt structural features and/or regulatory ring-fence provisions provide a regulated network is based primarily on an assessment of the following:

- A. Factors that reduce the likelihood that an issuer will default on its debt, and
- B. Factors that give creditors either the right, or ability to influence the taking of corrective action - to stop or reverse credit deterioration.

In order for structural features to provide ratings uplift they typically must benefit all debt creditors, although individual creditors may be subject to different payment priorities.

A. Factors that reduce the likelihood that an issuer will default on its debt

These comprise:

1. **Restriction on business activities.** Prohibiting an issuer from engaging in new activities or making acquisitions is seen as credit positive because it eliminates the business risk associated with corporate activity and ensures that all critical functionality is subject to the debt structural features.
2. **Restriction on raising additional debt.** Restricting additional indebtedness reduces the risk that additional obligations can cause a payment default.
3. **Distribution lock-up tests.** Prohibiting distributions to shareholders in a distressed scenario preserves cash within the business, thus reducing the risk of default.

4. **Limits on debt structure.** Requiring the issuer to remove or mitigate certain financial risks, such as interest rate, currency or refinancing risk. The latter can range from restrictions on debt maturity concentration to the implementation of a fully amortizing debt structure, which in itself can achieve a full notch of ratings uplift. Covenants can also restrict the issuer's use of derivative products, thus reducing the likelihood of additional and/or sizeable claims on the business.
5. **Reserves to cover large future or unforeseen costs.** Dedicated timing reserves for large-cost items, e.g., one-off capital expenditure.

B. Factors that give creditors either the right, or ability, to influence the taking of corrective action – to stop or reverse credit deterioration

An important element of leveraged infrastructure debt structures has been the ability of debt creditors to force owners to reduce debt ahead of the point where equity value is lost and debt is impaired, and to take action to repay debt through the enforcement of security if this is not achieved. The debt event of default tests and the consequences of these are key elements of this protection. To provide effective protection to creditors, these features need to work within the context of the business being financed, in most cases to allow the operating businesses to continue as a going concern and to allow debt service to be paid through available liquidity facilities while action is being taken.

The elements of debt structural features that provide control rights are assessed in the following areas:

1. **Effectiveness of control rights.** The degree to which the exercise of control rights may be impeded (e.g., local jurisdiction laws or certain regulatory restrictions). We assess the proposed terms and conditions in conjunction with legal guidance to ascertain whether the proposed control rights are likely to operate as intended.
2. **Length of the control period.** The length of time debt creditors have to exercise control rights before the issuer loses the right to generate cash flow from the assets (e.g., before an insolvency process or before a concession/regulatory license is terminated).
3. **Dedicated liquidity support.** Dedicated liquidity support facilities to cover ongoing debt service while control rights are exercised. To be considered valuable, such dedicated liquidity would need to be available for use in circumstances where control rights are exercised.

In almost all cases, to be effective and/or to assure the structure has integrity, debt structural features need to include the following elements:

1. The entity subject to the financing and the restrictions would be separated from the wider ownership group and any wider business group. The separation is achieved through legal means related to the creation of the issuer and/or restrictions in the financial structure.
2. All debt creditors must be subject to common terms that ensure that individual creditors or creditors cannot take unilateral action to destabilize the financing.
3. Creditor step-in rights should be specifically permitted under the concession, regulatory license or legal framework, as well as the finance documents. Note that we give value to security arrangements only as one element, albeit usually a critical element, of a wider package of features designed to improve creditors' ability to detect early potential problems and rectify them if possible (in the first instance by retaining cash surpluses within the company). Further, if remedial action is not possible or fails, the security arrangements are used to maximize recovery prospects.

Structural features that provide a meaningful level of creditor protection would provide a notching uplift to the composite score generated from the grid factors, a final step to arrive at the grid-indicated rating.

When assessing rating uplift we consider the package as a whole (i.e. elements of both A. and B. above) in order to gauge the overall effectiveness. For example, independent validation of compliance with financial ratio covenants may be an important consideration in assessing the ongoing effectiveness of such covenants.

Security is sometimes not allowed or is not enforceable on certain assets, the title of which may be retained by the state or other granting authority, or where the company is restricted from giving security over its assets by a pre-existing statute.

Structural enhancements that we view as very comprehensive and effective can deliver an uplift of up to three notches within the grid. However, across the rated universe, the current typical uplift is in the range of zero to two notches. Due to the broad spectrum of possible financing structures (which can contain a variety of elements in an array of potential combinations), these enhancements are scored in increments of half-a-notch. While debt structural features could in theory be stronger than those we have encountered, more restrictive terms and conditions would constrain management abilities to pursue strategies and policies and may not be suited to certain types of businesses, so they have typically fallen within a moderately narrow range.

Ratings fully incorporate our view of the actual structural or contractual features in a particular transaction. In rare cases contractual features may provide greater uplift to the issuer's credit quality than what is reflected in the scorecard.

Rating Methodology Assumptions, Limitations, and Rating Considerations That Are Not Covered in the Grid

The grid in this rating methodology represents a decision to favor simplicity that enhances transparency and to avoid greater complexity that might enable the grid to map more closely to actual ratings. Accordingly, the five rating factors in the grid do not constitute an exhaustive treatment of all of the considerations that are important for ratings of companies in this regulated networks sector. In addition, our ratings incorporate expectations for future performance, while the financial information that is used in the grid is mainly historical. In some cases, our expectations for future performance may be informed by confidential information that we cannot disclose. In other cases, we estimate future results based upon past performance, industry trends, competitor actions or other factors. In either case, predicting the future is subject to the risk of substantial inaccuracy.

Assumptions that may cause our forward-looking expectations to be incorrect include unanticipated changes in any of the following factors: the macroeconomic environment and general financial market conditions, industry competition, disruptive technology, regulatory and legal actions.

Key rating assumptions that apply in this sector include our view that sovereign credit risk is strongly correlated with that of other domestic issuers, that legal priority of claim affects average recovery on different classes of debt, sufficiently to generally warrant differences in ratings for different debt classes of the same issuer, and the assumption that lack of access to liquidity is a strong driver of credit risk.

In choosing metrics for this rating methodology grid, we did not explicitly include certain important factors that are common to all companies in any industry such as the quality and experience of management, assessments of corporate governance and the quality of financial reporting and information disclosure. Therefore ranking these factors by rating category in a grid would in some cases suggest too much precision in the relative ranking of particular issuers against all other issuers that are rated in various industry sectors.

Ratings may include additional factors that are difficult to quantify or that have a meaningful effect in differentiating credit quality only in some cases, but not all. Such factors include financial controls, exposure to uncertain licensing regimes and possible government interference in some countries. Regulatory, litigation, liquidity, technology and reputational risk as well as changes to consumer and business spending patterns, competitor strategies and macroeconomic trends also affect ratings. While these are important considerations, it is not possible to precisely express these in the rating methodology grid without making the grid excessively complex and significantly less transparent. Ratings may also reflect circumstances in which the weighting of a particular factor will be substantially different from the weighting suggested by the grid.

This variation in weighting rating considerations can also apply to factors that we choose not to represent in the grid. For example, liquidity is a consideration frequently critical to ratings and which may not, in other circumstances, have a substantial impact in discriminating between two issuers with a similar credit profile. As an example of the limitations, ratings can be heavily affected by extremely weak liquidity that magnifies default risk. However, two identical companies might be rated the same if their only differentiating feature is that one has a good liquidity position while the other has an extremely good liquidity position.

Other Rating Considerations

Ratings consider a number of additional considerations. These include but are not limited to: the impact of non-core businesses, our assessment of the quality of management, corporate governance, financial controls, liquidity management and event risk.

Impact of Non-Core Businesses

This methodology grid is applied to the assessment of issuers, whose primary activity is the ownership and operation of regulated electric and gas networks. Where the company has or will seek to diversify its operations towards other business types, we will determine the impact of such entities on credit quality. In particular, the ownership of material businesses with higher credit risk than electric and gas networks would likely result in an actual rating that is lower than the grid-indicated rating.

Liquidity and Access to Capital Markets

Liquidity analysis is a key element in the financial analysis of electric and gas networks, and it encompasses a company's ability to generate cash from internal sources as well as the availability of external sources of financing to supplement these internal sources. Liquidity and access to financing are of particular importance in this sector. Network assets can often have a very long useful life – 30, 40 or even 60 years is not uncommon, as well as high price tags. Furthermore, the sector has historically experienced prolonged periods of negative free cash flow, such that a portion of capital expenditure must be debt financed. Dividends also represent a quasi-permanent outlay, as networks only rarely will cut their dividend. Liquidity is also important to meet maturing obligations, which often occur in large chunks, and to meet collateral calls under any hedging agreements.

Our assessment of liquidity for regulated networks involves an analysis of total sources and uses of cash over the next 12 months or more. Using our financial projections and our analysis of its available sources of liquidity (including an assessment of the quality and reliability of alternate liquidity such as committed credit facilities), we evaluate how its projected sources of cash (cash from operations, cash on hand and existing committed multi-year credit facilities) compare to its projected uses (including all or most capital expenditures, dividends, maturities of short and long-term debt, our projection of potential liquidity calls on financial hedges, and important issuer-specific items such as special tax payments). We assume no access to capital markets or additional liquidity sources, no renewal of existing credit facilities, and no cut to

dividends. We examine a company's liquidity profile under this scenario, its ability to make adjustments to improve its liquidity position, and any dependence on liquidity sources with lower quality and reliability.

Management Quality

The quality of management is an important factor supporting a company's credit strength. Assessing the execution of business plans over time can be helpful in assessing management's business strategies, policies, and philosophies and evaluates management performance relative to performance of competitors and our projections. A record of consistency provides Moody's with insight into management's likely future performance in stressed situations and can be an indicator of management's tendency to depart significantly from its stated plans and guidelines.

Size

The size and scale of a regulated networks has generally not been a major determinant of its credit strength in the same way that it has been for most other industrial sectors. However, size can still be a very important factor in our assessment of certain risks that impact ratings, including event risk, construction risk and access to external funding. While the grid attempts to incorporate some of the execution risk around large or complex projects into Factor 2, for some issuers these considerations may be sufficiently important that the rating reflects a greater weight for these risks.

Interaction of Ratings with Government Policies and Sovereign Ratings

Compared to most industrial sectors, regulated networks are more likely to be impacted by government actions. Credit impacts can occur directly through regulation, and indirectly through energy, environmental and tax policies. While Factor 1 of the grid attempts to capture many of these risks, for some issuers a greater weighting may be appropriate in assessing the rating.

Corporate Governance

Among the areas of focus in corporate governance are audit committee financial expertise, the incentives created by executive compensation packages, related party transactions, interactions with outside auditors, and ownership structure.

Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor ratings in this sector. The quality of financial statements may be influenced by internal controls, including centralized operations and the proper tone at the top and consistency in accounting policies and procedures. Auditors comments in financial reports and unusual financial statement restatements or delays in regulatory filings may indicate weaknesses in internal controls.

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental creditworthiness. Typical special events include mergers and acquisitions, asset sales, spin-offs, capital restructuring programs, litigation and shareholder distributions.

Structural Subordination

A utility company can finance itself in many different ways but it may involve a regulated network operating company (OpCo) and a holding company (HoldCo) structure with debt located at different levels. Given that creditors of the HoldCo usually have a secondary claim on the group's cash flows and assets after OpCo creditors, this leads to structural subordination. Our ratings of HoldCo debt are usually notched downwards from our assessment of group credit quality (which ignores priority of claim) but takes into account a number of other factors including, *inter alia*, the following:

- » Regulatory or other barriers to cash movement from OpCos to HoldCos
- » Specific ring-fencing provisions or financial covenants at the OpCo level
- » HoldCo exposure to subsidiaries with high business risk or volatile cash flows
- » Strained liquidity at the HoldCo level

Appendix A: Regulated Electric and Gas Networks Methodology Factor Grid

	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Factor 1: Regulatory Environment and Asset Ownership Model (40%)								
Stability and Predictability of Regulatory Regime	15%	Regulation is independent, well established (> 15 years of being predictable and stable) and transparent (well-established regulatory principles clearly define risk allocation between companies and customers and are consistently applied, with public or shared financial models). These conditions are expected to continue.	Regulation is independent, well established (> 10 years of being predictable and stable) and transparent (well-established regulatory principles clearly define risk allocation between companies and customers and are generally consistently applied). These conditions are expected to continue.	Regulation is generally independent and developed (regulatory principles define risk allocation between companies and customers and are based on established precedents in the same jurisdiction). These conditions are expected to continue.	Regulatory framework is relatively new and untested, although regulatory principles are based on established precedents. Jurisdiction has a history of independent and transparent regulation for other utility services. These conditions are expected to continue.	Regulatory framework is defined but not consistently applied; tariff setting is subject to negotiation and political interference; some precedents in the country of predictable regulation for other utility services. These conditions are expected to continue.	Regulatory framework is unclear, untested or undergoing significant change, with a history of political interference. These conditions are expected to continue.	Regulatory framework is not defined, is unpredictable or politically driven with significant adverse consequences for the utility. These conditions are expected to continue.
Asset Ownership Model	5%	All key T&D assets held outright in perpetuity AND no risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held outright under licence which can be terminated for underperformance, failure to meet certain financial parameters or insolvency OR held under long term concession with clearly defined right to timely recovery of residual asset value at termination/end of concession underpinned by highly rated entity AND no risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held under long-term concession with clearly defined right to recover value of residual assets at termination/end of concession underpinned by highly rated entity but with undefined timeframe OR held under medium/long-term operating leases or management contracts with very substantial portfolio diversification, very established market position and very high renewal rate (>95%) AND no risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held under long-term concession with some entitlement to recover value of residual assets at termination/end of concession but procedures untested/undefined OR held under medium-term operating leases or management contracts with substantial portfolio diversification, established market position and high renewal rate (>90%) AND/OR jurisdiction has reasonably strong property rights although there is some, albeit low risk that a change in ownership would negatively affect creditor rights.	All key T&D assets held under concession with recovery of residual asset value at termination/end of concession subject to negotiation OR held under short-term operating leases or management contracts with good degree of portfolio diversification and renewal rate (>80%) AND/OR jurisdiction may have some laws detailing property rights although these may be untested. A change of ownership would likely result in a loss for creditors.	Key T&D assets held under short-term operating leases or management contracts (limited portfolio diversification) with limited clarity on renewal and/or compensation AND/OR probability of termination/expropriation is elevated. Compensation likely to be minimal and could be subject to significant delays in payment.	Company is in default of its licence, concession or lease/contract and is likely to lead to termination AND/OR expropriation very likely, no prospect of compensation.

	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Cost and Investment Recovery (Ability and Timeliness)	15%	No regulatory or contractual impediment to adjust tariffs (no approval or reviews required).	Tariff formula is expected to allow for timely recovery of operating expenditure including depreciation, electricity losses and balancing costs/shrinkage gas and a fair return on all investment. All capital expenditure is included in asset base as incurred. Unanticipated expenditure quickly reflected in allowed revenue with low, if any, efficiency assessment.	Tariff formula is expected to allow for recovery of operating expenditure including depreciation based on allowances set at frequent price reviews (5-yearly intervals or shorter) and a fair return on all efficient investment. Capital expenditure is included in asset base as incurred. Opex and capex subject to efficiency tests; electricity losses and balancing costs/shrinkage gas subject to efficiency test on volumes only (price is a pass through). Unanticipated expenditure generally quickly reflected in allowed revenue although this may not be until the following regulatory period and may be subject to a degree of regulatory scrutiny or sharing factor with customers. Performance is likely to be in line with regulatory expectations.	Tariff formula is expected to allow for recovery of operating expenditure including depreciation and return on investment but subject to retrospective regulatory approval or infrequent price reviews (> 5-yearly intervals); recovery of electricity losses and balancing costs/shrinkage gas is somewhat exposed to price. Some instances of revenue backloading expected (e.g. depreciation allowance set below asset consumption or operating expenditure is capitalized). Unanticipated expenditure slow to be reflected in allowed revenue or may be subject to a stringent efficiency assessment/ low sharing factor. Performance may be below regulatory expectations.	Tariff formula is not expected to take into account all cost components and depreciation is set below asset consumption; recovery of electricity losses and balancing costs/shrinkage gas has large exposure to price. Revenues expected to cover most operating expenditure but investment is not clearly or fairly remunerated. Overspend either not recognized in allowed revenue or there is high uncertainty about its future recognition. Operational underperformance likely to be significantly impacting the returns achieved by the business.	Tariff formula is not expected to take into account all cost components and depreciation is set below asset consumption; recovery of electricity losses and balancing costs/shrinkage gas is fully exposed to price. Revenues expected to cover cash operating expenditure.	Revenues expected to only partially cover cash operating costs.
Revenue Risk	5%	No exposure to volume risk. Collected revenues based on capacity charges.	Very low exposure to volume risk. Collected revenues based on volume charges with stable volumes expected. Revenue cap mechanism with timely recovery in place.	Limited exposure to volume risk. Collected revenues based on volume charges with some volatility in volumes expected. Revenue cap mechanism in place; OR Hybrid price/revenue cap with low volatility in volumes.	Moderate exposure to volume risk. Hybrid price/revenue cap with moderate volatility in volumes; OR Some reliance on connection revenues.	Material exposure to volume risk: price cap with significant volatility in volumes; OR Material reliance on connection revenues.	High exposure to volume risk: price cap with substantial volatility in volumes; OR Very high reliance on connection revenues.	Very high exposure to volume risk: price cap with high concentration of volumes to one particular customer or sector; OR Revenues mainly driven by connections.

	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Factor 2: Scale and Complexity of Capital Program (10%)								
Scale and Complexity of Capital Program	10%	Capex program is extremely limited in scale, reflecting a modern, highly developed asset base that requires only simple maintenance expenditure (e.g. total annual capex is < 4% of total fixed assets or regulated asset base).	Capex program is limited in scale, reflecting a well developed asset base that requires only maintenance expenditure (e.g. total annual capex is 4-6% of total fixed assets or regulated asset base).	Capex program is modest in size, reflecting a well developed asset base. Expenditure primarily relates to maintenance although some projects may be larger (e.g. total annual capex is 6-8% of total fixed assets or regulated asset base) or more complicated.	Capex program is manageable in size (e.g. total annual capex is 8-12% of total fixed assets or regulated asset base) or is generally straightforward (expenditure consists of a combination of replacement plus a number of development projects albeit with limited execution risk).	Capex program is large in size (e.g. total annual capex is 12- 20% of total fixed assets or regulated asset base) or is challenging in scope (small number of large and complex development projects account for the majority of capital expenditure and carry a degree of execution risk). Obligation to invest poses a financing challenge.	Capex program is very large in size (e.g. total annual capex is 20-30% of total fixed assets or regulated asset base) or highly complex in scope (one large or complex project accounts for majority of expenditure and carries a high execution risk). Capex obligation likely to pose a significant financing challenge.	Capex program is extremely large in size (e.g. total annual capex is ≥ 30% total fixed assets or regulated asset base) or is highly technically complex (one or more large projects account for the majority of expenditure and together carry a very high execution risk). Capex obligation likely to undermine the ongoing financial stability of the company.
Factor 3: Financial Policy (10%)								
Financial Policy	10%	Long track record and expected maintenance of extremely conservative financial policy; very stable metrics; low debt levels for the industry; AND Public commitment to the highest credit quality over the long-term.	Long track record and expected maintenance of a conservative financial policy; stable metrics; lower than average debt levels for the industry; AND Public commitment to a very high credit quality over the long-term.	Extended track record and expected maintenance of a conservative financial policy; moderate debt leverage and a balance between shareholders and creditors; Not likely to increase shareholder distributions and/or make acquisitions which could lead to a weaker credit profile; Solid commitment to high credit quality.	Track record and expected maintenance of a conservative financial policy; an average level of debt for the industry and a balance between shareholders and creditors; Some risk that shareholder distributions and/or acquisitions could lead to a weaker credit profile; Solid commitment to targeted metrics.	Track record or expectation of maintenance of a financial policy that is likely to favour shareholders over creditors; higher than average, but not excessive, level of leverage; Owners are likely to focus on extracting distributions and acquisitions but not at the expense of financial stability.	Track record of aggressive financial policies or expected to have a financial policy that favours shareholders through high levels of leverage with only a modest cushion for creditors; OR High financial risk resulting from shareholder distributions or acquisitions.	Expected to have a financial policy unfavourable to creditors with a track record of or expected policy of maintaining excessively high debt leverage; OR Elevated risk of debt restructuring.

	Sub-factor weight	Aaa	Aa	A	Baa	Ba	B	Caa
Factor 4: Leverage and Coverage (40%)								
Adjusted Interest Coverage Ratio: ⁸ (FFO + Interest Expense - Non-Cash Accretion ⁹ - Capital Charges) / (Interest Expense - Non-Cash Accretion) OR FFO Interest Coverage: (FFO + Interest Expense) / Interest Expense	10%	≥ 5.5x	3.5 - 5.5x	2 - 3.5x	1.4 - 2x	1.1 - 1.4x	0.9 - 1.1x	< 0.9x
		OR	OR	OR	OR	OR	OR	OR
		≥ 7.5x	5.5 - 7.5x	4 - 5.5x	2.8 - 4x	1.8 - 2.8x	1.1 - 1.8x	< 1.1x
Net Debt / RAB OR Net Debt / Fixed Assets ¹⁰	12.5%	< 30%	30 - 45%	45 - 60%	60 - 75%	75 - 90%	90% - 100%	≥ 100%
FFO / Net Debt ¹¹	12.5%	≥ 35%	26 - 35%	18 - 26%	11 - 18%	5 - 11%	0 - 5%	< 0%
RCF / Net Debt ¹⁰	5%	≥ 30%	21 - 30%	14 - 21%	7 - 14%	1 - 7%	(4) - 1%	< (4)%
Factor 5: Structural Considerations and Sources of Rating Uplift From Creditor Protection								
Number of Notches Provided by Debt Structural Features (0-3 notches)								

⁸ The adjusted ICR is our preferred metric for networks where allowed revenues/tariffs are determined using a 'building block approach' and where the components of allowed revenues/tariffs are routinely published and can be verified by an independent source, which in most cases is the regulatory authority itself. Required components of the revenue building block include: the total amount of allowed operating and capital expenditure, the portion of the RAB/asset base that provides for a return of capital (known as regulatory depreciation) and any other adjustments that can change the timing of cost recovery. It is calculated as: (FFO + Interest Expense - Non-Cash Accretion - Capital Charges) / (Interest Expense - Non-Cash Accretion). For regulated networks that utilize unconventional debt funding, such as zero-coupon, capital accretion, index-linked bonds or swap arrangements, we seek to make the appropriate adjustments to the ratio calculations to improve consistency and comparability to the peer portfolio. Please see Appendix B for a discussion of Capital Charges and some illustrative example of this ratio.

For other regulated networks, the ratio is calculated as (FFO + Interest Expense) / Interest Expense.

⁹ For clarity, Non-Cash Accretion is deducted in the numerator only to the extent it has been added to FFO, and it is deducted from the denominator only to the extent that it has been included in Interest Expense.

¹⁰ Net Debt / Regulatory Asset Base (RAB) is the preferred ratio where RAB is publicly available and when it represents the invested capital on which the network earns a return. Net Debt / Fixed assets is used in all other cases. Net Debt is total debt minus unrestricted cash. When Net Debt is negative, the score for this sub-factor is Aaa.

¹¹ For FFO / Net Debt and RCF / Net Debt, when Net Debt is negative and the numerator is a positive number (thus, a negative ratio), the score is Aaa. When Net Debt is negative and the numerator is a negative number (thus, a positive ratio), the score is B.

Appendix B: Calculating the Adjusted Interest Coverage Ratio for the Regulated Electric and Gas Networks Grid

As discussed in the section explaining Factor 4: Leverage and Coverage, a regulator has significant ability to alter the timing of a networks' cost recovery by changing specific parts of the regulatory formula, for example through:

1. **Regulatory asset lives/regulatory depreciation:** a regulator can change the rate at which capital is returned to a network by changing the rate of depreciation of the RAB. Reducing asset lives to increase the rate of depreciation increases a networks' regulatory revenue and thus its FFO in the short-term but decreases the RAB in relative terms in the long term (thus reducing future cash returns).
2. **Speed of money:** under ex-ante regulatory frameworks, a regulator can change the rate at which allowed total expenditure (operating + capital) is capitalized into the RAB. In the UK, the regulatory allowances for operating expenditure are known as 'fast money' whereas the allowances for capital expenditure are known as 'slow money'. If the regulator's rate of capitalization into the RAB is lower than is implied in a company's financial accounts, 'fast money' will be higher than statutory operating expenditure, which increases a networks' regulatory revenue and thus FFO.
3. **Revenue profiling:** a regulator may choose to smooth the impact of revenue changes on the end customer by profiling the trajectory of tariffs over a control period. Volatility in revenue potentially results from a regulated network's investment program which could be lumpy. This may lead to a trajectory of costs that rises and falls within a short-term frame. This may be undesirable from a regulator's perspective which may choose to manage this by profiling allowed revenue such that all costs are recovered but the impact on the consumer is reduced.

The adjusted ICR attempts to normalize for these 'regulatory levers' by adjusting FFO by an amount of money ("Capital Charges") that can be influenced by regulatory decision making in the allowed revenue calculation. The Capital Charges typically consist of some or all of the following:

- » Regulatory depreciation (for many regulated networks, this is the only Capital Charge)
- » The excess of 'fast money' over operating expenditure
- » The excess of 'profiled revenue' over 'un-profiled revenue'

In eliminating the effects of regulatory timing differences, the adjusted ICR instead tries to capture the credit effects of true cost outperformance and provide better comparability between networks that may be allowed greater current cash returns (either because revenue is being pushed forward or because the RAB is effectively being depleted faster) with those that are likely to have more stable returns over the longer term.

To illustrate these points, we consider four hypothetical regulated networks – company A, B, C and D, which have the same RAB. For all four companies, the regulator calculates allowed revenue using a 'building block' approach, i.e. money to cover operating expenditure (i.e. fast money), an allowed return to cover debt and equity costs plus regulatory depreciation, i.e. the portion of the RAB that has been allowed by the regulator to reward historic investment. Please see the table on the following page, which contains the specific numbers and ratios for each example.

Company A has a revenue of 200, of which 40 reflects regulatory depreciation, while company B has revenue of 240 and regulatory depreciation of 80. This reflects the regulator adopting a policy of 'accelerated depreciation' for company B, effectively bringing forward cash flow into the near-term to the detriment of the longer-term. This change results in an increase of revenue and FFO of 40 for company B, which significantly boosts its FFO-based financial ratios. In this example, FFO / net debt increases to 18%

from 12% and FFO interest coverage increases to 4.7x from 3.3x. In contrast, however, the adjusted ICR remains stable at 2.0x as the higher amount of regulatory depreciation is deducted from FFO for the purpose of the interest coverage ratio calculation. Our point in time example does not illustrate the effect of accelerated depreciation on net debt / RAB, which for Company B would be expected to increase over time unless debt were commensurately reduced or capex were commensurately higher.

Company C has a revenue of 220, which is 20 higher than for company A. The difference reflects the regulator allowing the company a higher amount of 'fast money' than their statutory amount of operating expenditure. In contrast, the amount of 'slow money' capitalized into the RAB (not illustrated) will be 20 lower than the statutory level of capital expenditure, lead to either less growth or a depletion of the RAB. Moody's considers this regulatory lever to be equivalent to the way revenue is influenced by changes to regulatory depreciation. Moody's therefore treats the 20 delta to be a further capital charge which is then deducted from FFO for the purpose of calculating the adjusted ICR. While FFO-based financial ratios are improved by increasing the speed of money, the adjusted ICR remains the same at 2.0x.

Company D has a revenue of 210, which is 10 higher than for company A. The difference reflects the regulator profiling the allowed revenue over the period of a price control in a different way than is implied by the company's expected evolution of costs (which may be volatile) but is preferred by the regulator because of the experience from the end consumer's perspective. If the profiling is calculated correctly, the Net Present Value of allowed revenue should be the same irrespective of the profiling method employed. In this example Moody's would treat the 10 amount of revenue benefit as a capital charge and would be deducted from FFO for the purpose of calculating the adjusted ICR. In contrast, in other periods within the price control, the profiling adjustment will be a negative amount but Moody's would adjust for it in a similar way (that negative amount would increase FFO net of Capital Charges).

		Company A	Company B	Company C	Company D
		(Conventional approach)	(Accelerated regulatory depreciation)	(Fast speed of money)	(Revenue profile adjusted)
Regulatory Asset Base (RAB)	[a]	1000	1000	1000	1000
Regulatory depreciation as a % of RAB	[b]	4%	8%	4%	4%
Net debt	[c]	600	600	600	600
Total debt	[d]	600	600	600	600
Allowed rate of return	[e]	6%	6%	6%	6%
Actual cost of debt	[f]	5%	5%	5%	5%
Actual interest expense	[g] = [d] x [f]	30	30	30	30
Regulatory capitalization rate (slow money as a % of total expenditure)	[h]	75%	75%	70%	75%
Statutory capitalization rate (capital expenditure as a % of total expenditure)	[i]	75%	75%	75%	75%
Total expenditure	[j]	400	400	400	400
Statutory operating expenditure	[k] = [1 - [i]] x [j]	100	100	100	100
Speed of money adjustment	[l] = [[i] - [h]] * [j]	0	0	20	0
Revenue Building Block					
Fast money	[m] = [k] + [l]	100	100	120	100
Regulatory depreciation	[n] = [a] x [b]	40	80	40	40
Allowed return	[o] = [a] x [e]	60	60	60	60
Revenue profiling adjustment	[p]	0	0	0	10
Revenue allowance	[q] = [m] + [n] + [o] + [p]	200	240	220	210
FFO	[r] = [[q] - [k] - [g]]	70	110	90	80
Capital charges					
-regulatory depreciation	[n]	40	80	40	40

		Company A	Company B	Company C	Company D
		(Conventional approach)	(Accelerated regulatory depreciation)	(Fast speed of money)	(Revenue profile adjusted)
-excess fast money over opex	$[s] = [m] - [k]$	0	0	20	0
-profiled revenue over unprofiled revenue	$[p]$	0	0	0	10
Total capital charges	$[t] = [n] + [s] + [p]$	40	80	60	50
FFO net of Capital Charges	$[y] = [r] - [t]$	30	30	30	30
Ratios					
- Net Debt / RAB	$[u] = [c] / [a]$	60%	60%	60%	60%
- FFO / Net debt	$[v] = [r] / [c]$	12%	18%	15%	13%
- (FFO + Interest Expense) / Interest Expense	$[w] = ([r] + [g]) / [g]$	3.3x	4.7x	4.0x	3.7x
- Adjusted Interest Coverage Ratio	$[x] = ([y] + [g]) / [g]$	2.0x	2.0x	2.0x	2.0x

Appendix C: Considerations for Ratings Within a Corporate Family

Our approach to the ratings of network entities within a corporate family includes an assessment of the degree to which the credit quality of each legal entity is interlinked with the rest of the family or the degree to which the family members are insulated from each other. We assess the total landscape in determining whether probability of default is similar for each family entity, differentiated but tightly banded around an overall family credit quality, or differentiated with a wider banding. There can be a broad range in the combinations of credit insulating elements that are present in each family and also in their effectiveness. Major considerations include:

Regulatory framework

- » Requirement that a network maintain a minimum financial profile (e.g., to comply with its regulatory license)
- » Requirement that a network maintain a particular capital structure in order to earn its allowed revenues/tariffs (versus a network whose tariffs are set based on an assumed capital structure)
- » Prohibition on pooling cash with a parent or certain affiliates or making loan advances to those entities (versus an ability of the parent company to pool the cash of all family entities)
- » Pre-approval by the regulator for debt issuance and liquidity arrangements (versus the ability of a network's management to freely make financing decisions)
- » Ability and willingness of the regulator to limit/prohibit the network from making dividend distributions to its parent

Financing structure

- » Strength or weakness of financial covenants and other structural features
- » The relative amounts of debt at each network and at holding companies (networks may have leverage at intermediate holding companies and at the parent company)
- » For a holding company, the extent to which it is dependent on the distributions of a particular network in order to meet its own obligations
- » Ability of each entity to meet its own liquidity needs (e.g., its dependence on external sources of support)

Corporate structure

- » A network subsidiary may have independent board members whose votes are necessary for major corporate actions, including voluntary bankruptcy (versus a corporate family where the board members of each subsidiary are all parent company board members or managers)
- » Network subsidiaries may have minority (and/or blocking) shareholders that must be consulted for major corporate actions

In many circumstances, the rating of a regulated network subsidiary is constrained by the overall credit quality of the group to which it belongs, because the regulatory treatment of its activities provides little credit insulation between entities and there is little restriction in the movement of cash between entities in the corporate or financing documents. The absence of such barriers tends to align the credit quality of a network with its family and parent. In these circumstances our rating analysis places a much heavier weight on an assessment of the consolidated group's credit quality, and the ratings of the family members are likely to be the same or very closely aligned. In these circumstances, a certain amount of credit deterioration at a weaker subsidiary within a utility family would more than likely be counterbalanced by stronger subsidiary(ies) and an expectation that the parent would find a way to direct support to the weak entity.

However, if the deterioration at a network subsidiary was severe (e.g., due to material regulatory challenges) and parent support was not assured, ratings within the group could be more differentiated, since the distressed regulated network could be rated well below the parent. There are aspects of the UK regulatory framework that have led to a partial de-linkage of ratings for group members. Typically, UK networks must: (1) maintain an investment grade credit rating; (2) not participate in sizeable unregulated business activities; (3) maintain at least 12 months of operating and financial resources; and (4) not pledge any of the network assets as collateral. Nevertheless, our approach to these groups typically starts with an assessment of consolidated credit quality and incorporates our view of the parent's activities, because until one of these triggers is breached, networks are mostly unimpeded from making distributions or maintaining a capital structure that is different than the one regulators assume when revenues/tariffs are set. However, were a trigger point to occur, e.g. if the credit quality of the wider parent fell below a certain level, the ratings of regulated networks with sufficiently protective arrangements may vary much more from the consolidated credit profile. Even in a situation of distress at the parent, regulated networks that are subject to these provisions may likely maintain a relatively high credit rating and could thus pierce the consolidated credit quality of the group by a substantial number of notches. In addition, notching within the family may be wider in the presence of debt structural features – these have been more widely used in the UK than other markets.

Even when meaningful regulatory barriers exist such that ratings of individual networks vary more widely from the consolidated credit profile, the credit quality of the parent still has an impact in most circumstances. Therefore, while credit analysis of the individual regulated network may have greater weight in our ratings, parent credit quality also plays a role. Nevertheless, in some jurisdictions there may be significant barriers to cash movement. For instance, in the United States, some state regulators engage in pervasive oversight of the financing arrangements of utility companies. Examples of state level oversight can include: (1) pre-approval by the regulator to increase indebtedness; (2) explicit leverage restrictions on the regulated entity and potentially on its immediate parent; (3) an expectation that the utility will maintain the capital structure utilized for rate-setting; (4) limitations on the exposure of a regulated network to its affiliates, for example via a regulated money pool arrangement; and (5) higher regulatory pressure that restricts dividends. Nevertheless, the benefit to creditors of these arrangements can vary significantly between different states and leads to a range in the barriers to cash movement between regulated companies and related entities. US networks rated pursuant to this methodology are regulated primarily by the Federal Energy Regulatory Commission (FERC), which has tended to exercise less pervasive oversight than most state regulators with respect to financing arrangements. A change in approach by regulators may change our approach to assessing the ratings of networks in any family that we consider to be affected.

Appendix D: A Summary of Industry Issues over the Intermediate Term

Political and regulatory issues

The credit quality of a regulated electric and gas network is particularly sensitive to its regulatory and political environment. Issuers that are highly rated tend to be domiciled in jurisdictions where there is a sizeable track record of consistent and predictable decision making by the regulator and an absence of political interference. A fundamental change in the overall regulatory environment for rated networks would have a significant impact on ratings of the affected issuers.

High investment requirements

Regulated networks face ongoing high capital expenditure programs to maintain, upgrade and grow their asset base. Across many jurisdictions, the age of network infrastructure is relatively old and often results in high inefficiencies in the system through losses and equipment failure. Networks are often therefore obliged to invest significant amounts to replace and upgrade these ageing assets in order to improve the reliability of electricity and gas supplies. In addition, networks are often required to expand their asset base in response to macroeconomic drivers such as population growth and increases in wealth and consumption. Networks often need to invest ahead of expected higher loads and changing demand patterns. Significant additional capital expenditure also reflects the changing structure of the electricity and gas industry, particularly in Europe but also in the United States. In these regions, the old model of large power stations producing power away from demand centers is changing with distributed generation sources (e.g., solar photovoltaic and onshore wind) increasingly dominant in power supplies. The abundance of such non-conventional generation sources requires networks to invest in new connections but also to facilitate the two-way flow of electricity across the grid.

In a supportive regulatory environment, which allows for cost recovery and a reasonably contemporaneous return on investments, high levels of capital expenditure need not be a major credit concern. Should upward pressure on utility rates to consumers caused by major new grid investments diminish the regulatory support for regulated networks, there could be a negative impact on their ratings. In addition, a significant capital program that is either: (1) high relative to the size of the existing asset base; and/or (2) complex and involves new forms of technology (and thus greater likelihood of substantial cost over-runs) - could introduce meaningful execution risk that could negatively affect a networks' credit profile and its rating. In addition, an out-sized capital program will also likely present a financing challenge for a network, potentially negatively impacting its liquidity profile.

Economic and financial market conditions

Compared with other corporate issuers, networks tend to be more insulated from macroeconomic and financial market conditions as their revenues are determined by a regulatory authority and are set for a fixed period of time. Networks also tend to be relatively immune from a reduction in demand partly reflecting the generally lower elasticity of electricity and gas consumption but also the presence of 'revenue caps', also called 'de-coupling'. Revenue caps allow networks to adjust their tariffs as required in order to recover their full revenue entitlement even as demand profiles change – revenues are de-coupled from volumes.

In general, regulated networks tend to be more highly leveraged than similarly rated corporate issuers on account of their typically lower business risk profile. Since the 2008-09 global financial crisis, regulated networks have therefore benefitted from a significant decline in market interest rates reflecting in part the monetary policies of global central banks. However, a secondary consequence of a reduction in interest rates is that the allowed financial return (as determined by regulators) has also fallen. In general, networks were positively affected as their overall cost of debt has declined at a quicker rate than regulatory returns. However, some networks may be exposed, particularly if their average debt tenor is substantially longer than the time period considered by regulators when making this assessment. In such a scenario, regulatory returns will fall at a quicker rate than a company's cost of debt, leading to a weakening of key credit metrics. A further uncertainty is the response of regulators to rising interest rates, if and when this occurs, as both debt and equity investors will require a higher overall rate of return, but regulators may be unwilling to increase regulated tariffs by the same amount.

Moody's Related Research

The credit ratings assigned in this sector are primarily determined by this credit rating methodology. Certain broad methodological considerations (described in one or more credit rating methodologies) may also be relevant to the determination of credit ratings of issuers and instruments in this sector. Potentially related sector and cross-sector credit rating methodologies can be found [here](#).

For data summarizing the historical robustness and predictive power of credit ratings assigned using this credit rating methodology, see [link](#).

Definitions of Moody's most common ratio terms can be found in "Moody's Basic Definitions for Credit Statistics, User's Guide", accessible via this [link](#).

Please refer to Moody's Rating Symbols & Definitions, which is available [here](#), for further information.

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