MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY

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Rating Methodology

Regulated Electric and Gas Networks

This rating methodology replaces the *Regulated Electric and Gas Networks* methodology published in March 2017. We have differentiated the Leverage and Coverage sub-factors for project-financed and corporate issuers. We have also reordered and have made editorial updates to various sections of the methodology, and we have changed the presentation of the scorecard.

Scope

This methodology applies to companies globally that are primarily* engaged in the transmission or distribution of electricity or natural gas or both. The companies rated using this methodology provide their services primarily to non-retail customers. They operate as monopolies within their service territory with tariffs regulated at the regional, national or sovereign level. This methodology also applies to oil pipelines that are national monopoly businesses and that are subject to tariff regulation.

Transmission companies rated using this methodology are engaged in the high-voltage/high-pressure transportation of electricity and gas. Distribution companies rated using this methodology provide low-voltage/low-pressure transportation of electricity and gas.

Regulated electric and gas networks, which we also refer to as regulated networks, predominantly operate infrastructure assets with no significant ownership of upstream activities, e.g., electricity generation or gas production, or downstream activities. 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, which procure electricity and gas on behalf of the end consumer and are themselves responsible for providing utility services, including billing and metering. As monopolies, the charges that networks can levy are determined by a regulatory authority at the regional, national or sovereign level, with tariffs typically reviewed periodically.

While many companies rated using this methodology are regulated networks financed on a corporate basis, this methodology also applies to project-financed entities that are primarily

*The determination of a company's primary business is generally based on the preponderance of the company's business risks, which are usually proportionate to the company's revenues, earnings and cash flows.

engaged in the ownership and operation of electric and gas network infrastructure and whose debt fully amortizes by its final legal maturity date.

Companies that are engaged in the transmission or distribution of electricity or natural gas or both but that also provide regulated utility services to a retail customer base; that, in many cases, also own regulated electricity generation assets are rated using our regulated electric and gas utilities methodology. Unregulated utilities and power companies, US public power utilities with generation ownership (including US municipal utilities) and US electric generation and transmission cooperatives are rated using separate methodologies. Natural gas pipeline owners and operators that typically 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, are rated using our natural gas pipelines methodology.[1]

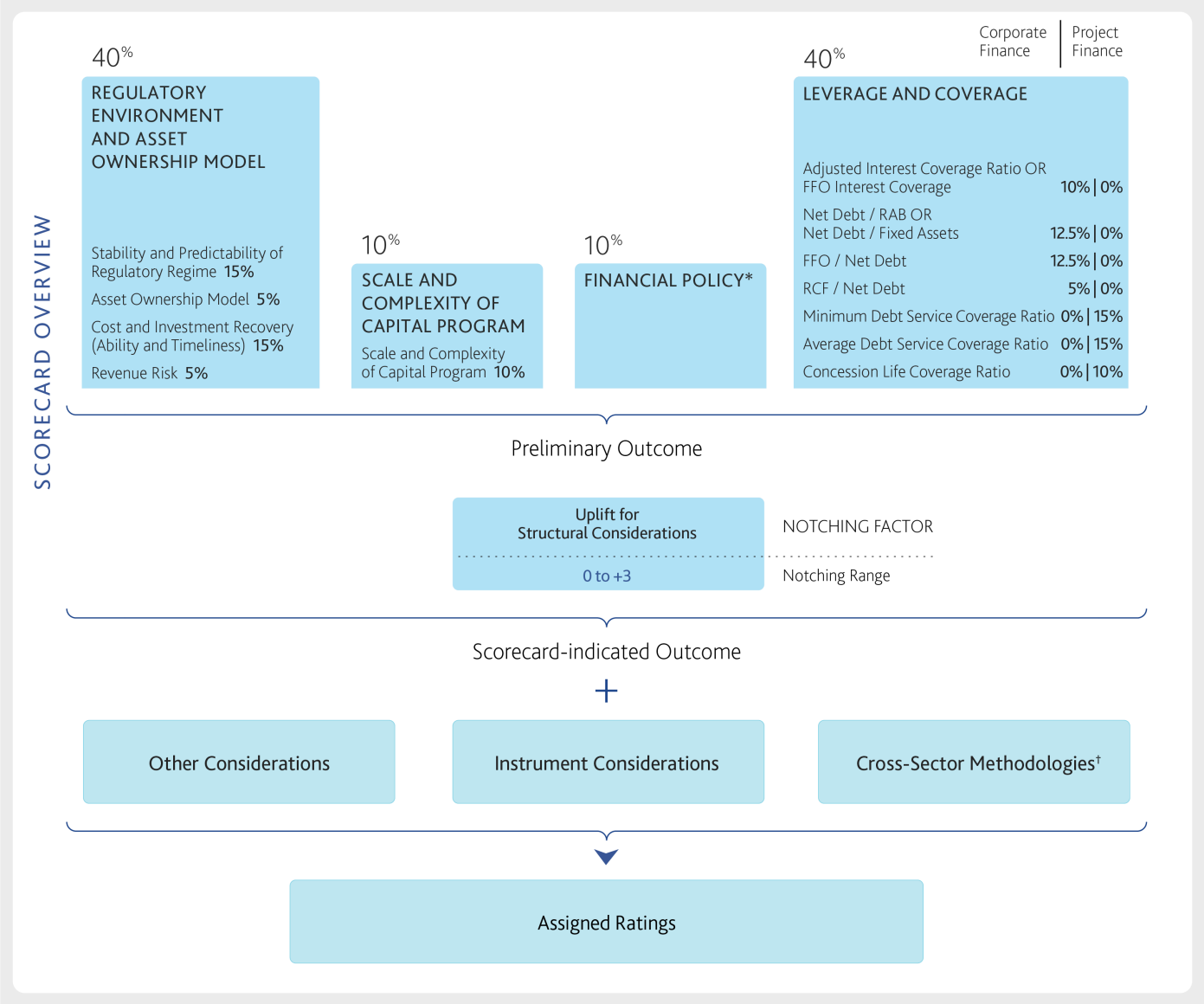
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the regulated electric and gas network sector globally, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector. We seek to incorporate all material credit considerations in ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

The following schematic illustrates our general framework for the analysis of regulated electric and gas networks, which includes the use of a scorecard.[2] The scorecard-indicated outcome is not expected to match the actual rating for each company. For more information, see the "Other considerations" and "Limitations" sections.

Exhibit 1

Illustration of the regulated electric and gas networks methodology framework



* This factor has no sub-factors.

† Some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

Source: Moody's Investors Service

Regulated electric and gas networks scorecard

For general information about how we use the scorecard and for a discussion of scorecard mechanics, please see the "Using the scorecard to arrive at a scorecard-indicated outcome" section. The scorecard does not include or address every factor that a rating committee may consider in assigning ratings in this sector. Please see the "Other considerations" and "Limitations" sections.

Exhibit 2

Regulated electric and gas networks scorecard

	REGULATORY ENVIRONMENT AND ASSET OWNERSHIP MODEL (40%)				SCALE AND COMPLEXITY OF CAPITAL PROGRAM (10%)	FINANCIAL POLICY (10%)	LEVERAGE AND COVERAGE (40%)								
							Corporate Issuers						Project-financed Issuers		
	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%)	Financial Policy (10%)	Adjusted Interest Coverage Ratio (3-Year Avg)	OR (10%)	FFO Interest Coverage (3-Year Avg)	Net Debt / RAB OR Net Debt / Fixed Assets (3-Year Avg) (12.5%)	FFO / Net Debt (3-Year Avg)[1] (12.5%)	RCF / Net Debt (3-Year Avg)[2] (5%)	Minimum Debt Service Coverage Ratio (15%)	Average Debt Service Coverage Ratio (15%)	Concession Life Coverage Ratio (10%)
Aaa	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.	All key T&D assets held outright in perpetuity AND no risk that a change in ownership would negatively affect creditor rights.	No regulatory or contractual impediment to adjust tariffs (no approval or reviews required).	No exposure to volume risk. Collected revenues based on capacity charges.	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 < 4% of total fixed assets or regulated asset base).	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.	≥ 5.5x		≥ 7.5x	< 30%	≥ 35%	≥ 30%	≥ 3.00x	≥ 3.00x	≥ 4.50x
Aa	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.	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.	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.	Very low exposure to volume risk. Collected revenues based on volume charges with stable volumes expected. Revenue cap mechanism with timely recovery in place.	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).	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.	3.5x - 5.5x		5.5x - 7.5x	30% - 45%	26% - 35%	21% - 30%	1.55x - 3.00x	2.00x - 3.00x	3.00x - 4.50x

	REGULATORY ENVIRONMENT AND ASSET OWNERSHIP MODEL (40%)				SCALE AND COMPLEXITY OF CAPITAL PROGRAM (10%)	FINANCIAL POLICY (10%)	LEVERAGE AND COVERAGE (40%)								
							Corporate Issuers						Project-financed Issuers		
	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%)	Financial Policy (10%)	Adjusted Interest Coverage Ratio (3-Year Avg)	OR (10%)	FFO Interest Coverage (3-Year Avg)	Net Debt / RAB OR Net Debt / Fixed Assets (3-Year Avg) (12.5%)	FFO / Net Debt (3-Year Avg)[1] (12.5%)	RCF / Net Debt (3-Year Avg)[2] (5%)	Minimum Debt Service Coverage Ratio (15%)	Average Debt Service Coverage Ratio (15%)	Concession Life Coverage Ratio (10%)
A	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.	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.	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.	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.	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.	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.	2.0x - 3.5x		4.0x - 5.5x	45% - 60%	18% - 26%	14% - 21%	1.35x - 1.55x	1.50x - 2.00x	2.00x - 3.00x

	REGULATORY ENVIRONMENT AND ASSET OWNERSHIP MODEL (40%)				SCALE AND COMPLEXITY OF CAPITAL PROGRAM (10%)	FINANCIAL POLICY (10%)	LEVERAGE AND COVERAGE (40%)								
							Corporate Issuers						Project-financed Issuers		
	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%)	Financial Policy (10%)	Adjusted Interest Coverage Ratio (3-Year Avg)	OR (10%)	FFO Interest Coverage (3-Year Avg)	Net Debt / RAB OR Net Debt / Fixed Assets (3-Year Avg) (12.5%)	FFO / Net Debt (3-Year Avg)[1] (12.5%)	RCF / Net Debt (3-Year Avg)[2] (5%)	Minimum Debt Service Coverage Ratio (15%)	Average Debt Service Coverage Ratio (15%)	Concession Life Coverage Ratio (10%)
Baa	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.	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 a that a change in ownership would negatively affect creditor rights.	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.	Moderate exposure to volume risk. Hybrid price/revenue cap with moderate volatility in volumes; OR Some reliance on connection revenues.	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).	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.	1.4x - 2.0x		2.8x - 4.0x	60% - 75%	11% - 18%	7% - 14%	1.20x - 1.35x	1.30x - 1.50x	1.35x - 2.00x

	REGULATORY ENVIRONMENT AND ASSET OWNERSHIP MODEL (40%)				SCALE AND COMPLEXITY OF CAPITAL PROGRAM (10%)	FINANCIAL POLICY (10%)	LEVERAGE AND COVERAGE (40%)								
							Corporate Issuers						Project-financed Issuers		
	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%)	Financial Policy (10%)	Adjusted Interest Coverage Ratio (3-Year Avg)	OR (10%)	FFO Interest Coverage (3-Year Avg)	Net Debt / RAB OR Net Debt / Fixed Assets (3-Year Avg) (12.5%)	FFO / Net Debt (3-Year Avg)[1] (12.5%)	RCF / Net Debt (3-Year Avg)[2] (5%)	Minimum Debt Service Coverage Ratio (15%)	Average Debt Service Coverage Ratio (15%)	Concession Life Coverage Ratio (10%)
Ba	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.	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.	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.	Material exposure to volume risk: price cap with significant volatility in volumes; OR Material reliance on connection revenues.	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.	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.	1.1x - 1.4x		1.8x - 2.8x	75% - 90%	5% - 11%	1% - 7%	1.10x - 1.20x	1.15x - 1.30x	1.20x - 1.35x
B	Regulatory framework is unclear, untested or undergoing significant change, with a history of political interference. These conditions are expected to continue.	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.	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.	High exposure to volume risk: price cap with substantial volatility in volumes; OR Very high reliance on connection revenues.	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.	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.	0.9x - 1.1x		1.1x - 1.8x	90% - 100%	0% - 5%	(4%) - 1%	1.00x - 1.10x	1.00x - 1.15x	1.10x - 1.20x

	REGULATORY ENVIRONMENT AND ASSET OWNERSHIP MODEL (40%)				SCALE AND COMPLEXITY OF CAPITAL PROGRAM (10%)	FINANCIAL POLICY (10%)	LEVERAGE AND COVERAGE (40%)									
							Corporate Issuers						Project-financed Issuers			
	Stability and Predictability of Regulatory Regime	Asset Ownership Model	Cost and Investment Recovery (Ability and Timeliness)	Revenue Risk	Scale and Complexity of Capital Program	Financial Policy	Adjusted Interest Coverage Ratio (3-Year Avg)	OR	FFO Interest Coverage (3-Year Avg)	Net Debt / RAB OR Net Debt / Fixed Assets (3-Year Avg)	FFO / Net Debt (3-Year Avg)[1]	RCF / Net Debt (3-Year Avg)[2]	Minimum Debt Service Coverage Ratio	Average Debt Service Coverage Ratio	Concession Life Coverage Ratio
Caa	Regulatory framework is not defined, is unpredictable or politically driven with significant adverse consequences for the utility. These conditions are expected to continue.	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.	Revenues expected to only partially cover cash operating costs.	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.	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.	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.	< 0.9x		< 1.1x	≥ 100%	< 0%	< (4%)	< 1.00x	< 1.00x	< 1.10x

Notching Factor
Uplift for Structural Considerations
(0 to +3 notches)

[1] When net debt is negative and FFO is positive, the score is Aaa. When net debt is negative and FFO is negative, the score is B.
[2] When net debt is negative and RCF is positive, the score is Aaa. When net debt is negative and RCF is negative, the score is B.
Source: Moody's Investors Service

Discussion of the scorecard factors

In this section, we explain our general approach for scoring each scorecard factor or sub-factor, and we describe why they are meaningful as credit indicators.

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

Why it matters

A regulated electric and gas network's regulatory environment and its asset ownership model greatly influence the stability and predictability of its cash flows.

As monopoly providers of essential transmission and distribution services, electric and gas networks 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. The ability to recover prudently incurred costs in a timely manner is extremely important because 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, are key credit considerations.

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. The nature of the ownership of the network and/or the rights to charge customers for its use 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 can be terminated relatively easily by the regulator or the licensing authority, hence giving only a short period to benefit from the revenue capacity of the network. Termination 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.

How we assess it for the scorecard

Scoring for this factor is based on four sub-factors: Stability and Predictability of Regulatory Regime; Asset Ownership Model; Cost and Investment Recovery (Ability and Timeliness); and Revenue Risk.

STABILITY AND PREDICTABILITY OF REGULATORY REGIME:

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 of these conditions. In addition, we also consider 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 typically receives a higher score for this sub-factor than a network operating in a less developed regulatory environment or one characterized by a high level of political intervention. The way in which changes to the regulatory framework or to existing utility law are implemented can vary. Where regulatory or legislative change occurs, a network may receive a high score for this sub-factor if there was sufficient consultation with the affected companies during the process and the changes are supportive of the network's credit quality. In contrast, a network may receive a lower score for this sub-factor if changes to the regulatory framework have been implemented without consultation, are unclear or are detrimental to credit quality.

ASSET OWNERSHIP MODEL:

Where an issuer does not own the network assets, we consider the risk that a license or concession may be terminated. We also consider whether the right to charge customers for their use of the network assets effectively may be short-to-medium term and therefore transitory. Ownership of what are, in many cases, assets of national importance is commonly subject to a license. 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 or interconnector systems).

A company that owns all key network assets outright in perpetuity and has control over them would typically receive a higher score for this sub-factor, and a company that holds its key assets under a short-term operating lease or license-type arrangement would typically receive a lower score. Scoring for this sub-factor in the case of issuers with concession agreements or more permanent licenses would typically be somewhere in the middle of the range and would depend on (i) the nature of events that could cause a loss of concession or license; (ii) the time frame 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. A network that operates in a jurisdiction with no perceived risk of expropriation and where the laws pertaining to property rights are well established typically receives a higher score for this sub-factor. A lack of well-established laws pertaining to property rights may be mitigated by other considerations, such as government ownership. The regulatory framework of networks that score A and above for this sub-factor needs to include well-established creditor and property rights, such that we do not perceive any risk that a change in ownership (including by expropriation) would negatively affect creditors, which can often be mitigated where the government owns the network. Where there is a heightened risk of expropriation of sector assets with limited potential for compensation, a company would typically receive a lower score for this sub-factor, even if it owns its assets outright.

COST AND INVESTMENT RECOVERY:

In assessing this sub-factor, we consider 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 is able to pass through its incurred costs, including financial costs, easily. A network that has complete flexibility to set tariffs so that it can meet current and future operating and capital costs without impediment would typically receive a higher score for 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 range. 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, the score for this sub-factor would typically be lower.

REVENUE RISK:

We consider the ability of a network to generate the revenue allowed to it by the regulator. In general, a network's revenue can vary from this pre-determined level based on differences between actual volumes and those 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.

Gas and electricity transmission tends to be less volatile than distribution due to its wider geographic reach (e.g., volumes are arguably more stable and predictable where exposed to a country's entire economy than to 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 ultimately be no direct link between volume volatility and revenue generation as some regulators de-couple the two, given that volumes are outside of a network company's control. In such cases, a regulator may choose to eliminate volume risk entirely (e.g., 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.

A network whose revenues are entirely de-linked from volumes transported typically receives a higher score for this sub-factor. A network that has some exposure to volume risk but that benefits from a regulatory formula that allows for the recovery of any lost revenue typically scores in the middle of the range. In contrast, a network that has higher exposure to volumes or where volumes are

expected to be particularly volatile typically receives a lower score for this sub-factor. We also take into account a network's reliance on revenue 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: Scale and Complexity of Capital Program (10% weight)

Why it matters

The scale and complexity of a network's capital investment plan provide important indications of execution risk. Given the global trend of population growth, renewable generation deployment and decarbonization requirements, and the increased roll-out of innovative technologies (such as smart grids and electric cars), many networks have large and ongoing capital investment programs.

Many companies also may need to replace aging grids, or improve their reliability. For most networks, a sizable capital expenditure program is a permanent feature of their business model. While networks are generally experienced in carrying out large construction programs, such programs nonetheless introduce execution risk to the enterprise. The program may take longer than envisaged to complete or could cost more than expected. Furthermore, cost overruns may not be recoverable from future revenue 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 management, which could lead to underperformance in other areas of the business.

How we assess it for the scorecard

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

The size of a network's capital expenditure plans may, to some extent, be correlated with the complexity of the program, particularly for material capacity increases or technically challenging projects. We consider the annual amount of the capital expenditure plan as a percentage of the regulatory asset base or total fixed assets. However, this percentage may not directly correlate to risk in all scenarios. For example, a replacement program such as the laying of polyethylene gas pipe may be large in scope but present only limited execution risk. Here the technology is relatively simple and well established. Another example where the size of a capital program may not be correlated to risk is a large capital expenditure program comprising a significant number of individual projects where overall execution risk is reduced through diversification.

A network undertaking a relatively small but specific or complex investment program would typically receive a lower score for this factor than a network involved in a number of small and simple projects. We consider total capital expenditure, including those outside of the core regulated activity. Although such activities would generally not negatively impact core regulated operations directly, material investments outside of the core regulated business may weaken a network's ability to service debt 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) typically receive higher scores for this factor. In contrast, networks that need to modernize their systems and engage in complex, concentrated programs that are challenging to finance (and where annual capital expenditure represents a high percentage of fixed assets) generally receive lower scores for this factor.

Factor: Financial Policy (10% weight)

Why it matters

Management and board tolerance for financial risk is an important rating factor because 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 our assessment of this factor, we consider the likelihood that financial policy decisions, in their totality, could add uncertainty to future cash flow levels and divert resources that may otherwise be available to service debt. In this regard, management's track record and its public commitment to maintaining the issuer's credit quality are key considerations.

How we assess it for the scorecard

We consider the company's approach to financing its activities, especially the balance it strikes in apportioning risk between shareholders and creditors. We assess both the company's 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 or opaque, or where there is a lack of track record, the regulated network typically receives a lower score than if its shareholders have longer-term return requirements and may be willing to forgo near-term distributions to maintain flexibility.

Issuers typically receive a higher score for this factor if they have an extended track record of low levels of leverage and a public commitment to maintaining high 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 typically receives a score in the middle of the range. However, scores of Baa and higher are generally only assigned 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 typically receive a score of Ba or lower for this factor.

This factor is scored separately from the Uplift for Structural Considerations notching factor, which is used to assess structural features and sources of rating uplift from creditor protection. However, where they exist, such enhancements are considered in our assessment of the Financial Policy factor to the extent they define or clarify the issuer's overall financial policy.

Factor: Leverage and Coverage (40% weight)

Why it matters

Leverage and coverage measures are critical indicators of a regulated network's financial flexibility and long-term viability, including the ability to adapt to changes in the economic and regulatory environments in which it operates.

We distinguish between networks that use a corporate financing structure and those that use a project financing structure. The financing structure is important because corporate-financed networks typically have greater flexibility, e.g., a wide latitude to transform their business, buy and sell assets, take on additional leverage and refinance their debt. Project financing structures typically limit the scope of the issuer's business activities and its ability to incur additional debt.

Corporate-financed Networks

For corporate-financed issuers, this factor comprises four sub-factors: Adjusted Interest Coverage Ratio or Funds From Operations Interest Coverage; Net Debt/Regulatory Asset Base or Net Debt/Fixed Assets; FFO/Net Debt; and Retained Cash Flow/Net Debt.

Adjusted Interest Coverage Ratio or Funds from Operations Interest Coverage

The Adjusted Interest Coverage Ratio (AICR) and Funds from Operations (FFO) Interest Coverage are indicators of a regulated network's ability to meet its interest obligations.

We use the AICR for regulated 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. The AICR adjusts FFO by an amount of money (Capital Charges) that the regulator includes within current revenue at the expense or benefit of future revenue. The removal of capital charges from FFO allows for greater comparability of interest coverage for networks within a regulatory regime and for networks across different regulatory regimes. See appendix B for examples.

We use FFO Interest Coverage for regulated networks 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.

Net Debt / Regulatory Asset Base (RAB) or Net Debt / Fixed Assets

The ratio of net debt to regulated asset base (Net Debt/RAB) and the ratio of net debt to fixed assets (Net Debt/Fixed Assets) are indicators of debt serviceability and financial leverage. These ratios provide a basis for comparing the size of an issuer's debt relative to that of its peers.

We use Net Debt/RAB for regulated networks 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.

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

FFO / Net Debt

The ratio of FFO to net debt (FFO/Net Debt) is more useful in comparing the ability of a network (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 A). More specifically, a higher FFO/ Net Debt ratio may not be a sign of financial strength where it is driven by a higher level of regulatory depreciation. Nevertheless, in comparing two companies that maintain a similar Net Debt/RAB ratio over time, a higher FFO/Net Debt ratio is usually indicative of greater financial strength.

RCF / Net Debt

The ratio of retained cash flow to net debt (RCF/Net Debt) is an indicator of a network's cash generation (before working capital movements and capital expenditures, and after dividend payments) relative to its net debt (total debt minus cash and cash equivalents). Dividend obligations of networks are often substantial, quasi-permanent outflows that can affect the ability of a network to cover its debt obligations. This ratio can also provide insight into a regulated network's financial policies. The higher the level of retained cash flow relative to debt, the more cash the network has to support its capital expenditure program.

Project-financed Networks

For project-financed issuers, this factor comprises three sub-factors: Minimum Debt Service Coverage Ratio (DSCR), Average DSCR and Concession Life Coverage Ratio (CLCR).

Debt Service Coverage Ratio

The minimum DSCR and average DSCR are measures of financial leverage and debt repayment capacity. Project-financed electric and gas networks' net cash flows can be more stable and predictable than project-financed issuers in other sectors, resulting in both the minimum and average DSCRs providing indications of an issuer's ability to sustain lower cash flows from unexpected events before debt service is impaired and its ability to pay its debt service from available cash flow within the remaining tenor of its license or concession. An issuer that maintains high minimum and average DSCRs with a comfortable excess coverage margin is typically better able to withstand short-term cash flow disruptions.

Concession Life Coverage Ratio

The concession life coverage ratio (CLCR) provides an important indication of an issuer's capacity to pay its debt service over the remaining tenor of the license or concession.

How we assess it for the scorecard

In assessing regulated electric and gas networks, we use project finance metrics where (i) the debt is fully amortizing; and (ii) the financing contains many of the structural features that may provide protection to creditors listed in the "Uplift for Structural

Considerations" notching factor section. Networks that do not have fully amortizing debt and many of these structural features are assessed using corporate financing metrics.

Corporate-financed Networks

ADJUSTED INTEREST COVERAGE RATIO:

The numerator is FFO plus interest expense minus non-cash accretion minus capital charges. For clarity, we calculate interest expense minus non-cash accretion and add this number back to FFO. To the extent FFO is calculated after interest expense but without deducting non-cash accretion, we typically add this non-cash accretion to FFO.

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

The denominator is interest expense minus non-cash accretion.

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

FFO INTEREST COVERAGE:

The numerator is FFO plus interest expense, and the denominator is interest expense.

NET DEBT / RAB:

The numerator is net debt (total debt minus cash and cash equivalents), and the denominator is the regulated asset base.

NET DEBT / FIXED ASSETS:

The numerator is net debt (total debt minus cash and cash equivalents), and the denominator is fixed assets. Fixed assets is used as a proxy for the network assets necessary to fulfil the regulatory obligations. The denominator is typically net property, plant and equipment (PP&E). However, where companies report network assets operated under concession contracts as intangible assets (e.g., under IFRIC 12), we make an adjustment to include such assets in the denominator.

FFO / NET DEBT:

The numerator is FFO, and the denominator is net debt (total debt minus cash and cash equivalents).

RCF / NET DEBT:

The numerator is RCF, and the denominator is net debt (total debt minus cash and cash equivalents).

Project-financed Networks

For project-financed networks, we use three sub-factors: the minimum DSCR, the average DSCR and the CLCR.

In general, the focus of our assessment of project finance leverage and coverage financial metrics is forward-looking. We generally use cash flow projections based on our own assessment of the most likely financial and operating parameters and sensitivities. We also typically consider a number of downside or sensitivity scenarios to test the resiliency of the project's cash flows. Our central scenario and sensitivities may be informed by third-party technical or market consultants, and they may be different from the owner's or sponsor's projections. For projects that have a track record, historical performance generally has a strong influence on our view of likely future results, unless there is a material change in the project's operating parameters or market dynamics. As a result, historical results are among the drivers that can cause changes to our central scenario and downside or sensitivity scenarios over time.

DEBT SERVICE COVERAGE RATIO:

The DSCR is typically calculated based on the projections, through the scheduled maturity of the issuer's debt. The minimum DSCR is the lowest of the future periodic coverage ratios, while the average DSCR is the average of the future periodic coverage ratios.

To calculate the DSCR for any 12-month period, the numerator is cash flow available for debt service (CFADS), and the denominator is scheduled interest and principal as defined in the finance documents, excluding cash sweeps.

CFADS equals cash flow from operations (before interest) minus maintenance capital expenditure plus (or minus) transfers from (or to) timing reserves, if relevant. We do not include movements in the debt service reserve account. Because the calculation of CFADS is based on operating cash flow, this numerator incorporates movements in working capital.

Interest and principal equals cash interest and principal in the relevant period. Interest excludes interest income (which is included in the numerator).

CONCESSION LIFE COVERAGE RATIO:

The numerator is the sum of (i) the net present value of future CFADS through the revenue entitlement period of the license or concession and (ii) the debt service reserve account. The denominator is total debt. We use the weighted average cost of the senior secured debt as the discount rate.

For concessions held in perpetuity, future CFADS includes any fixed tariff period and may include CFADS for a longer period if there is visibility over regulated revenue beyond the fixed tariff period.

Notching factor

Our assessment of the Uplift for Structural Considerations notching factor may result in an upward adjustment to the preliminary outcome that results from the four weighted scorecard factors. Adjustments may be made in half-notch or whole-notch increments.

In aggregate, structural features that we consider effective may result in up to three upward notches from the preliminary outcome to arrive at the scorecard-indicated outcome. However, typical uplift is between a half notch and one and a half notches. In cases where we consider that the credit weakness or credit strength represented by this notching factor is greater than the scorecard range, we incorporate this view into the rating, which may be different from the scorecard-indicated outcome.

Uplift for Structural Considerations

Why It matters

A regulated electric and gas network's debt structure may contain structural features that can provide creditors meaningful protection against losses. 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. These features are important because they can restrict the issuer's ability to take actions that could increase credit risk, thereby reducing the likelihood of default or increasing the likelihood of higher recovery in the event of default, or both.

How we assess it for the scorecard

We typically consider the extent to which structural features and regulatory ring-fence provisions (i) reduce the likelihood of default; and (ii) give creditors either the right, or ability, to influence a network's decision to take corrective action to stop or reverse credit deterioration. The impact of these structural features on notching is based on a holistic assessment of their effectiveness.

STRUCTURAL FEATURES THAT REDUCE THE LIKELIHOOD OF DEFAULT:

In assessing structural features that reduce the likelihood of default, we typically assess the following:

Restriction on business activities

» The extent to which an issuer is prohibited from engaging in new activities or making acquisitions.

Restrictions on raising additional debt

» Whether restrictions on additional indebtedness reduce the risk that additional obligations could cause a payment default.

Distribution lock-up tests

» The extent to which an issuer is prohibited from distributing cash to shareholders in periods of financial stress.

Limits on debt structure

» Whether the issuer is required to remove or mitigate certain financial risks, such as interest rate, currency or refinancing risk. Structural features that can reduce refinancing risk include restrictions on debt maturity concentration and the implementation of a fully amortizing debt structure, which by itself can result in one notch of ratings uplift. Covenants can also restrict the issuer's use of derivative products, thus reducing the likelihood of additional or sizeable claims on the business.

Reserves to cover large future or unforeseen costs

» The presence of dedicated timing reserves for large-cost items, e.g., a one-off capital expenditure.

STRUCTURAL FEATURES THAT GIVE CREDITORS THE RIGHT, OR ABILITY, TO INFLUENCE AN OPERATOR'S DECISION TO TAKE CORRECTIVE ACTION:

We assess the ability of debtholders to force owners to reduce debt before equity value is lost and debt is impaired, and to take action to repay debt through the enforcement of security provisions if this is not achieved. Financing document events of default or other events giving rise to debtholder controls, and the consequences of their breach or trigger, are key elements of this protection. To provide effective protection to creditors, these features work within the context of the business being financed, in most cases to allow the operating businesses to continue as going concerns and to allow debt service to be paid through available liquidity facilities while action is being taken.

In assessing structural features that provide control rights, we typically consider the following:

Effectiveness of control rights

» The extent to which the exercise of control rights may be impeded (e.g., local jurisdiction laws or certain regulatory restrictions).

» The proposed terms and conditions, in conjunction with opinions of counsel, to ascertain whether the proposed control rights are likely to operate as intended.

Length of the control period

» The length of time 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).

Dedicated liquidity support

» The extent to which dedicated liquidity support covers ongoing debt service while control rights are exercised. To be considered effective, such dedicated liquidity would need to be available for use in circumstances where control rights are exercised.

To be considered effective, structural features typically include the following:

» The entity subject to the financing and the restrictions is 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 or restrictions in the financial structure.

» All creditors are subject to common terms that ensure that an individual creditor or a group of creditors cannot take unilateral action to destabilize the financing.

» Creditor step-in rights are specifically permitted under the concession, regulatory license or legal framework, as well as the financing documents. In our assessment, we consider security arrangements to be 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). In addition, if remedial action is not possible or fails, the security arrangements are used to maximize recovery prospects.

We also consider the quality of security arrangements on material collateral. 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.

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.

Other considerations

Ratings may reflect consideration of additional factors that are not in the scorecard, usually because the factor's credit importance varies widely among the issuers in the sector or because the factor may be important only under certain circumstances or for a subset of issuers. Such factors include financial controls and the quality of financial reporting; corporate legal structure; the quality and experience of management; assessments of corporate governance as well as environmental and social considerations; 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 and macroeconomic trends also affect ratings.

Following are some examples of additional considerations that may be reflected in our ratings and that may cause ratings to be different from scorecard-indicated outcomes.

Non-Core Businesses

As described in the "Scope" section, this methodology applies to issuers whose primary activity is the ownership and operation of regulated electric and gas networks. Where an issuer has diversified or may diversify a portion of its operations towards other business types, we assess the impact on credit quality. In particular, the ownership of material businesses with higher credit risk than electric and gas networks would likely result in an assigned rating that is lower than the scorecard-indicated outcome.

Liquidity and Access to Capital Markets

Liquidity is an important rating consideration for all 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. Network assets frequently have a very long useful life —- 30, 40 or even 60 years is not uncommon — as well as high development or acquisition costs. 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 are also a quasi-permanent outlay, as networks rarely lower their dividend. Liquidity is also important to meet maturing debt obligations, which can be large, and to meet collateral calls under hedging agreements.

We assess liquidity for regulated networks through analysis of the sources and uses of cash over the next 12 months or more. Through analysis of an issuer's available sources of liquidity (including our financial projections and assessment of the quality and reliability of alternative sources of liquidity, such as committed credit facilities), we evaluate how projected sources of cash (cash from operations, cash on hand and existing committed multi-year credit facilities) compare to projected uses (including all or most capital expenditures, dividends, maturities of short and long-term debt, potential liquidity calls on financial hedges, and 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 dividend reduction. We also assess a company's ability to make adjustments to improve its liquidity position, and any dependence on liquidity sources with lower quality and reliability. Please see our liquidity cross-sector methodology.[3]

Management Strategy

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. Management's track record of adhering to stated plans, commitments and guidelines provides insight into management's likely future performance, including in stressed situations.

Size

The size and scale of a regulated network has generally not been a major determinant of its credit strength in the same way that it has been for many other sectors. However, size can still be a very important consideration in our assessment of certain credit risks, including event risk, construction risk and access to external funding. While the Scale and Complexity of Capital Program factor seeks to incorporate some of the execution risk involving large or complex projects, 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

Regulated networks are more likely to be affected by government actions than companies in most other sectors. Credit impacts can occur directly through regulation, and indirectly through energy, environmental and tax policies. While the Regulatory Environment and Asset Ownership Model factor seeks to capture many of these risks, a greater weighting may be appropriate in assessing some issuers' ratings.

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in the regulated electric and gas networks sector. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[4]

Increasing environmental requirements and efforts to reduce greenhouse gas emissions (known as carbon transition risk) may lead to higher costs for many industries. Key considerations for regulated networks include the impact of carbon transition policies on tariffs and cost recovery mechanisms as well as access to capital. Electricity networks will remain essential as economies decarbonize, leaving most of them with neutral to low carbon transition exposure despite significant investment requirements. In contrast, gas networks in many markets will be adversely affected by decarbonization, particularly of residential heating, although this risk is mitigated by the likelihood that their assets will remain in use for decades, providing the opportunity to recover their investments and amortize debt under well-defined regulatory frameworks, or potentially to adapt their networks to transport lower carbon gases.

Storms, hurricanes, floods and wildfires have the potential to damage electricity networks, causing operational disruptions and necessitating expensive repairs. These risks can be mitigated by reinforcing networks and ensuring that nodes can be supplied from multiple entry points. The cost of doing so may be significant, particularly if climate change accelerates. Insurance and specific cost-recovery mechanisms for regulated networks may reduce but not eliminate the risk, as can broad geographic diversification.

Social issues, including concerns about clean and affordable energy, are important considerations. Networks are highly exposed to socially driven policy agendas resulting from public concern about affordable energy and environmental issues, combined with the direct involvement of governments and regulators in setting energy policy. Typically, this risk is lower in markets with transparent regulatory frameworks, where independent regulators follow well-established principles that clearly define risk allocation between companies and customers. Public interest in reducing carbon emissions and addressing global warming can influence public policy. Gas networks' exposure to responsible production issues is typically greater than for electricity networks and includes public safety risks related to possible gas leaks and explosions and the operating costs incurred to mitigate these risks.

For corporate networks, regulatory frameworks have typically required a fairly high level of transparency in financial reporting, in addition to review of capital spending programs, which has tended to have a positive impact on governance. Where regulated networks are owned by government shareholders, we typically assess the risk that credit quality will be sacrificed to achieve public policy goals. We would typically also assess owners' track record in preserving long-term viability and providing additional governance oversight, and the potential for ongoing support. For government-related issuers, we also consider the likelihood of extraordinary support. Please see the Parental Support consideration in this section.

Our assessment of the financial structure of project-financed regulated networks provides meaningful insights into governance risks. For example, covenants typically explicitly limit debt leverage and require hedging or insuring against key risks. Well structured project financings that provide for a clear contractual allocation of risks among lenders, owners and contractors also limit risk associated with organizational 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 the proper tone at the top, centralized operations, and consistency in accounting policies and procedures. Auditors' reports on the effectiveness of internal controls, auditors' comments in financial reports and unusual restatements of financial statement 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 which may cause actual ratings to be lower than the scorecard-indicated outcome. Event risks — which are varied and can range from leveraged recapitalizations to sudden regulatory changes or liabilities from an accident — can overwhelm even a stable, well-capitalized firm. Some other types of event risks include M&A, asset sales, spin-offs, litigation, pandemics, geopolitical conflict, significant cyber-crime events and shareholder distributions.

Additional Metrics

The metrics included in the scorecard are those that are generally most important in assigning ratings to issuers in this sector; however, we may use additional metrics to inform our analysis of specific companies. These additional metrics may be important to our forward view of metrics that are in the scorecard or other rating factors.

For example, free cash flow is not always an important differentiator of credit profiles. Strong companies with excellent investment opportunities may demonstrate multiyear periods of negative free cash flow while retaining solid access to capital and credit, because these investments will yield stable cash flows in future years. Weaker companies with limited access to credit may have positive free cash flow for a period of time because they have curtailed the investments necessary to maintain their assets and future cash-generating prospects. However, in some cases, free cash flow can be an important driver of the future liquidity profile of an issuer, which, as noted above, can have a meaningful impact on ratings.

Parental Support

Ownership can provide ratings lift for a particular company in the regulated electric and gas networks sector if it is owned by a highly rated owner(s) and is viewed to be of strategic importance to those owners. In our analysis of parental support, we consider whether the parent has the financial capacity and strategic incentives to provide support to the issuer in times of stress or financial need (e.g., a major capital investment or advantaged operating agreement), or has already done so in the past. Conversely, if the parent puts a high dividend burden on the issuer, which in turn reduces its flexibility, the ratings would reflect this risk.

Government-related issuers may receive ratings uplift due to expected government support. However, for certain issuers, government ownership can have a negative impact on the underlying Baseline Credit Assessment.[5] For example, price controls, onerous taxation and high distributions can have a negative effect on an issuer's underlying credit profile.

Structural Subordination

An energy utility may finance itself in many different ways, including using a regulated network operating company (OpCo) and a holding company (HoldCo) structure, with debt 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 downward from our assessment of group credit quality (which ignores priority of claim) but takes into account a number of other considerations including 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.

Using the scorecard to arrive at a scorecard-indicated outcome

1. Measurement or estimation of factors in the scorecard

In the "Discussion of the scorecard factors" section, we explain our analytical approach for scoring each scorecard factor or sub-factor,[6] and we describe why they are meaningful as credit indicators.

The information used in assessing the sub-factors is generally found in or calculated from information in the company's financial statements or regulatory filings, derived from other observations or estimated by Moody's analysts. We may also incorporate non-public information.

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. Financial ratios,[7] unless otherwise indicated, are typically calculated based on the average of the last three years of reported results. As described in the "Discussion of the Scorecard Factors" section, the debt service coverage and concession life coverage ratios are typically calculated on a forward-looking basis. However, the factors in the scorecard can be assessed using various time periods. For example, rating committees may find it analytically useful to examine both historical and expected future performance for periods of several years or more.

All of the quantitative credit metrics for corporate regulated networks incorporate our standard adjustments[8] to income statement, cash flow statement and balance sheet amounts for items such as underfunded pension obligations and operating leases. We may also make other analytical adjustments that are specific to a particular corporate or project-financed network.

2. Mapping scorecard factors to a numeric score

After estimating or calculating each factor or sub-factor, each outcome is mapped to a broad Moody's rating category (Aaa, Aa, A, Baa, Ba, B, Caa or Ca, also called alpha categories) and to a numeric score.

Scorecard factors are scored based on the description by broad rating category in the scorecard. The numeric value of each alpha score is based on the scale below.

Exhibit 3

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

Source: Moody's Investors Service

3. Determining the overall scorecard-indicated outcome

The numeric score for each sub-factor (or each factor, when the factor has no sub-factors) is multiplied by the weight for that sub-factor (or factor), with the results then summed to produce an aggregate numeric score.

A further weighting is then applied by rating category as shown in the table below:

Exhibit 4

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

Source: Moody's Investors Service

We weight lower scores more heavily than higher scores in the scorecard because a serious weakness in one area often cannot be completely offset by strength in another.

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%).

The numeric score for each sub-factor is multiplied by the adjusted weight for that sub-factor, with the results then summed to produce an aggregate numeric score before notching factors (the preliminary outcome). We then consider whether the preliminary outcome that results from the weighted factors should be notched upward or downward[9] in order to arrive at an aggregate numeric

score after notching factors. The Uplift for Structural Considerations notching factor can result in a total of up to three upward notches from the preliminary outcome to arrive at the scorecard-indicated outcome.

The aggregate numeric score before and after the notching factor is mapped to an alphanumeric. For example, an issuer with an aggregate numeric score before notching factors of 11.7 would have a Ba2 preliminary outcome, based on the ranges in the table below. If the combined notching factors totaled two upward notches, the aggregate numeric score after notching factors would be 9.7, which would map to a Baa3 scorecard-indicated outcome.

Exhibit 5

Scorecard-indicated outcome

Scorecard-Indicated Outcome	Aggregate Numeric Score
Aaa	x < 1.5
Aa1	1.5 ≤ x < 2.5
Aa2	2.5 ≤ x < 3.5
Aa3	3.5 ≤ x < 4.5
A1	4.5 ≤ x < 5.5
A2	5.5 ≤ x < 6.5
A3	6.5 ≤ x < 7.5
Baa1	7.5 ≤ x < 8.5
Baa2	8.5 ≤ x < 9.5
Baa3	9.5 ≤ x < 10.5
Ba1	10.5 ≤ x < 11.5
Ba2	11.5 ≤ x < 12.5
Ba3	12.5 ≤ x < 13.5
B1	13.5 ≤ x < 14.5
B2	14.5 ≤ x < 15.5
B3	15.5 ≤ x < 16.5
Caa1	16.5 ≤ x < 17.5
Caa2	17.5 ≤ x < 18.5
Caa3	18.5 ≤ x < 19.5

Source: Moody's Investors Service

In general, the scorecard-indicated outcome is oriented to the corporate family rating (CFR) or senior unsecured rating for corporate issuers and to the senior secured rating for project finance issuers. For issuers that benefit from rating uplift from parental support, government ownership or other institutional support, we consider the underlying credit strength or Baseline Credit Assessment for comparison to the scorecard-indicated outcome. For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers.[10]

Assigning issuer-level and instrument-level ratings

After considering the scorecard-indicated outcome, other considerations and relevant cross-sector methodologies, for corporate issuers we typically assign a CFR to speculative grade issuers or a senior unsecured rating for investment-grade issuers and for project-financed issuers we typically assign a senior secured rating. For issuers that benefit from rating uplift from government ownership, we may assign a Baseline Credit Assessment.[11]

Individual debt instrument ratings may be notched up or down from the CFR, the senior secured rating or the senior unsecured rating to reflect our assessment of differences in expected loss related to an instrument's seniority level and collateral. The documents that provide broad guidance for such notching decisions are the rating methodology on loss given default for speculative grade non-financial companies, the methodology for notching corporate instrument ratings based on differences in security and priority of claim, and the methodology for assigning short-term ratings.[12]

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[13]

Limitations

In the preceding sections, we have discussed the scorecard factors and many of the other considerations that may be important in assigning ratings. In this section, we discuss limitations that pertain to the scorecard and to the overall rating methodology.

Limitations of the scorecard

There are various reasons why scorecard-indicated outcomes may not map closely to actual ratings.

The scorecard in this rating methodology is a relatively simple reference tool that can be used in most cases to approximate credit profiles of issuers in this sector and to explain, in summary form, many of the factors that are generally most important in assigning ratings to these issuers. Credit loss and recovery considerations, which are typically more important as an issuer gets closer to default, may not be fully captured in the scorecard. The scorecard is also limited by its upper and lower bounds, causing scorecard-indicated outcomes to be less likely to align with ratings for issuers at the upper and lower ends of the rating scale.

The weights for each factor and sub-factor in the scorecard represent an approximation of their importance for rating decisions across the sector, but the actual importance of a particular factor may vary substantially based on an individual company's circumstances.

Factors that are outside the scorecard, including those discussed above in the "Other Considerations" section, may be important for ratings, and their relative importance may also vary from company to company. In addition, certain broad methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.[14] Examples of such considerations include the following: how sovereign credit quality affects non-sovereign issuers, the assessment of credit support from other entities, the relative ranking of different classes of debt and hybrid securities, and the assignment of short-term ratings.

We may use the scorecard over various historical or forward-looking time periods. Furthermore, in our ratings we often incorporate directional views of risks and mitigants in a qualitative way.

General limitations of the methodology

This methodology document does not include an exhaustive description of all factors that we may consider in assigning ratings in this sector. Companies in the sector may face new risks or new combinations of risks, and they may develop new strategies to mitigate risk. We seek to incorporate all material credit considerations into ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

Ratings reflect our expectations for an issuer's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard inputs or in other considerations, typically diminishes. Our forward-looking opinions are based on assumptions that may prove, in hindsight, to have been incorrect. Reasons for this could include unanticipated changes in any of the following: the macroeconomic environment, general financial market conditions, industry competition, disruptive technology, or regulatory and legal actions. In any case, predicting the future is subject to substantial uncertainty.

Appendix A: Calculating the Adjusted Interest Coverage Ratio for the Regulated Electric and Gas Networks Scorecard

As described in the Leverage and Coverage factor discussion, a regulator may seek to alter the timing of a network's cost recovery by changing specific parts of the regulatory formula through, for example, the following:

1. **Regulatory asset life/regulatory depreciation:** A regulator may change the rate at which capital is returned to a network through adjustment of the rate of depreciation of the regulated asset base (RAB). Reducing asset life in order to increase the rate of depreciation results in an increase in a networks' regulatory revenue and FFO in the short term but results in a decrease in the RAB and long-term cash flow.
2. **Speed of money:** Under ex-ante regulatory frameworks, a regulator may 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 elected regulatory 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 network's regulatory revenue and FFO in the short-term. In the long term, the situation may reverse, decreasing FFO.
3. **Revenue profiling:** A regulator may smooth the impact of revenue changes on consumers by profiling the trajectory of tariffs over a control period. Cash flow volatility that may result from a network's investment program, which could be lumpy, may be undesirable to a regulator. The regulator may choose to address this volatility by profiling allowed revenue such that all costs are recovered and the impact on the consumer is reduced.

The AICR ratio seeks to normalize for these regulatory levers by adding or subtracting amounts (capital charges) to FFO related to regulatory decision-making in the allowed revenue calculation. Capital charges may include:

» 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 unprofiled revenue

In eliminating the effects of regulatory timing differences, the AICR ratio instead seeks to capture normalized cost outperformance and provide better comparability among networks.

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., revenue 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 historical investment.

Company A has revenue of 200, of which 40 reflects regulatory depreciation, while company B has revenue of 240 and regulatory depreciation of 80. This reflects adoption by the regulator of a policy of "accelerated depreciation" for company B, effectively accelerating cash flow in the short term to the detriment of long-term cash flow. 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, the AICR remains stable at 2.0x as the higher 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 was commensurately reduced or capital expenditure was commensurately higher.

Company C has revenue of 220, which is 20 higher than that of company A; the difference due to the regulator allowing Company C a higher level of "fast money" than their statutory amount of operating expenditure. In contrast, the level of "slow money" capitalized into the RAB (not illustrated) is 20 lower than the statutory level of capital expenditure, which leads to either less growth or a depletion of the RAB. We consider this regulatory lever to be equivalent to the way revenue is impacted by changes to regulatory depreciation. We therefore view this 20 as a further capital charge that we deduct from FFO in calculating the AICR Ratio. While FFO-based financial ratios are improved by increasing the speed of money, the AICR Ratio remains the same.

Company D has revenue of 210, which is 10 higher than that of company A. The difference reflects that the regulator has profiled the allowed revenue over the period of a price control in a way that is different from that implied by the company's expected evolution of costs (which may be volatile) but is preferred by the regulator due to the reduced impact on consumers. The Net Present Value of allowed revenue should be the same irrespective of the profiling method employed. In this example, we treat the revenue benefit of 10 as a capital charge and deduct it from FFO for the purpose of calculating the AICR Ratio. In contrast, in other periods within the price control the profiling adjustment will be a negative amount, but we would adjust for it in a similar way (the negative amount would increase FFO net of capital charges).

Exhibit 6

		Company A (Conventional approach)	Company B (Accelerated regulatory depreciation)	Company C (Fast speed of money)	Company D (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
-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

Source: Moody's Investors Service

Appendix B: Considerations for Ratings Within a Corporate Family

Our assessment of entities within a network's corporate family includes the extent to which the credit quality of each legal entity is interlinked or insulated from other entities within the family. We perform a holistic assessment in determining whether the 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. We assess the credit-insulating elements in the family as well as 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 to earn its allowed revenues/tariffs (compared to a network whose tariffs are set based on an assumed capital structure)

» Prohibition on pooling cash with a parent or affiliates or on making loan advances to those entities (compared to an ability of the parent company to pool the cash of all family entities)

» Requirement that the regulator pre-approve debt issuance and liquidity arrangements (compared to a network's unrestricted ability to make financing decisions)

» A regulator's ability and willingness to limit or prohibit a network from making dividend distributions to its parent

Financing structure

» Strength or weakness of financial covenants and other structural features

» The relative debt levels 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 affirmative votes are required for major corporate actions, including voluntary bankruptcy (compared to a corporate family where the board members of each subsidiary are all parent company board members or managers)

» Network subsidiaries may have minority (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 , because the regulatory treatment of its activities provides limited credit insulation between entities, and the corporate and financing documents provide limited restriction in the movement of cash between entities. The absence of such credit insulation tends to result in an alignment of the credit quality of a network with its family and parent. In these circumstances, our analysis considers the consolidated group's credit quality, and the ratings of the family members are likely to be the same as or very closely aligned to the consolidated group's credit quality. A certain amount of credit deterioration at a weaker subsidiary within the same group would typically 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 and the rating of the distressed regulated network could be well below that of the parent.

Certain aspects of the UK regulatory framework have led to a partial de-linkage of ratings for group members. UK networks typically must: (i) maintain an investment grade credit rating; (ii) not participate in sizeable unregulated business activities; (iii) maintain at least 12 months of operating and financial resources; and (iv) not pledge any of the network assets as collateral. Nevertheless, our approach for assessing these groups typically starts with the group's 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 from the one regulators assume when revenues/tariffs are set. However, if a trigger occurred, e.g., the credit quality of the consolidated group fell below a certain level, the ratings of regulated networks within the group that have sufficiently protective arrangements may deviate more widely from the consolidated credit profile. Even in a situation of distress at the parent, regulated networks that are subject to these provisions could retain a relatively high credit rating that may be significantly higher than the consolidated credit quality of the group. In addition, notching within the family may be more extensive when debt structural features are present; these have been more widely used in the UK than in other markets.

Even where meaningful regulatory barriers exist such that ratings of individual regulated entities vary more widely from the consolidated credit profile, the credit quality of the parent still impacts an individual network's ratings in most circumstances. Therefore, while the credit analysis of individual regulated networks may have greater weight in our ratings, our assessment of parent credit quality is also important. Nevertheless, in some jurisdictions there may be significant barriers to cash movement between group entities. In the US, for example, some state regulators oversee the financing arrangements of regulated entities. State level oversight can include: (i) regulatory pre-approval to increase indebtedness; (ii) leverage restrictions for the regulated entity and, potentially, for its immediate parent; (iii) an expectation that the regulated entity will maintain the capital structure utilized for rate-setting; (iv) limitations on the exposure of a regulated entity to its affiliates via, for example, a regulated money pool arrangement; and (v) regulatory pressure to restrict dividends. Nevertheless, the benefit to creditors of these arrangements can vary significantly among states, resulting in a spectrum of barriers to cash movement between regulated companies and related entities. US networks 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 affected corporate families.

Moody's related publications

Credit ratings are primarily determined through the application of sector credit rating methodologies. Certain broad methodological considerations (described in one or more cross-sector rating methodologies) may also be relevant to the determination of credit ratings of issuers and instruments. A list of sector and cross-sector credit rating methodologies can be found here.

For data summarizing the historical robustness and predictive power of credit ratings, please click here.

For further information, please refer to *Rating Symbols and Definitions*, which is available here.

Moody's Basic Definitions for Credit Statistics (User's Guide) can be found here.

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Endnotes

1 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

2 In our methodologies and research, the terms "scorecard" and "grid" are used interchangeably.

3 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

4 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

5 For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology that describes our approach for assessing government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

6 Some factors do not have sub-factors, in which case we score at the factor level. When a factor comprises sub-factors, we score at the sub-factor level.

7 For definitions of our most common ratio terms, please see *Moody's Basic Definitions for Credit Statistics (User's Guide)*. A link can be found in the "Moody's related publications" section.

8 For an explanation of our standard adjustments, please see the cross-sector methodology that describes our financial statement adjustments in the analysis of non-financial corporations.

9 Numerically, a downward notch adds 1 to the score, and an upward notch subtracts 1 from the score.

10 A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

11 For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

12 A link to a list of our sector and cross-sector rating methodologies can be found in the "Moody's related publications" section.

13 A link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

14 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

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.

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