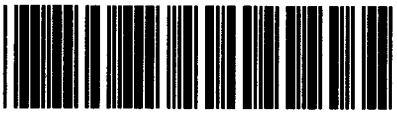
Control Number: 38339



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SOAH DOCKET NO. 473-10-5001
PUC DOCKET NO. 38339

APPLICATION OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC FOR AUTHORITY TO CHANGE RATES	§ § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

SUPPLEMENTAL WORKPAPERS

TO

REBUTTAL TESTIMONY

OF

DANIEL K. HEDGES

ON BEHALF OF

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

COST OF SERVICE RATE ADJUSTMENT FILING
PURSUANT TO PURA SEC. 36.102

Filed: October 5, 2010

655

The following workpapers were referenced in preparing the Rebuttal Testimony of Daniel K. Hedges:

1. Schedule of RFIs prepared by L. Johnston (Attached)

2. Testimony of Intervenors' and Staff's witnesses (Available on the PUC Interchange):
   a. A. Hodgins (Interchange Filings 395, 396 and COH responses to MJ-1-3, MJ-1-4, MJ-1-5, and MJ-1-6);
   b. L. Kollen (Interchange Filing 378);
   c. J. Brazell (Interchange Filing 377); and
   d. M. Jacobs:
      i. Cross-Rebuttal Testimony (Interchange Filing 535)
      ii. Supplemental Direct Testimony (Interchange Filing 558)

3. Responses to RFIs (Attached)
   a. CenterPoint Responses to COH: 1-13; 2-11, 12; 3-4, 5
   b. CenterPoint Responses to TCUC: 1-04, 06, 10, 19, 23, 30; 2-7, 26, and 27
   c. CenterPoint Responses to GCCC: 7-10
   d. CenterPoint Response to: PUC 2-01

4. Technical Conference Notice (Attached)

Prepared by L. Johnston

Subject	RFI#	Reference
SEC	COH01-19	Refers to Exhibit filed with testimony
	COH05-25	Refers to SEC website for CNP 10K
	COH23-02	Refers to SEC website for CNP 10K
	GCCC01-01U*	Attached document and gave date provided to SEC
	GCCC01-03*	Refers that it is available on the SEC website but attached documents
	GCCC01-19*	Provides documents that were not provided in RFP,not on the interchange or not publicly available on the SEC website
	GCCC01-38	WP provided; states source document available on the SEC website
	GCCC07-10*	Refers to the 10-K available on SEC website
	OPC01-16	Refers to Exhibit filed with testimony
	TIEC08-08	Refers to Form DEF 14A available on SEC website
	TLSC/TXROSE03-23	Refers to CEHE's 2007, 2008 and 2009 10-Ks available on SEC website
	TLSC/TXROSE03-24	Refers to 03-23
Reference to other websites	COH01-13	PUC Website
	COH02-12	ERCOT website
	COH02-21	CNP website
	COH05-25	SEC & CNP Website
	COH06-05	PUC Website
	COH06-06	PUC Website
	COH07-23	CNP website
	COH11-02	PUC Website
	COH11-03	PUC Website
	COH11-04	PUC Website
	COH11-05	PUC Website
	COH18-15	PUC Website
	COH18-16	PUC Website
	COH18-17	PUC Website
	GCCC02-01	Government website
	GCCC02-11	PUC Website
	GCCC03-16	PUC Website
	TIEC07-09	PUC Website
RFP	COH01-12	Refers to workpapers provided in RFP
	COH01-19	Refers to testimony and workpapers provided in RFP
	COH01-20	Refers to schedules provided in RFP
	COH02-03	Refers to workpapers provided in RFP
	COH02-14	Refers to testimony and workpapers provided in RFP
	COH02-16	Refers to workpapers provided in RFP
	COH02-18	Refers to information provided in testimony
	COH02-19	Refers to information provided in exhibit to testimony
	COH02-22	Refers to information provided in exhibit to testimony
	COH20-01	Refers to workpapers provided in RFP
	COH03-16	Refers to schedule provided in RFP
	COH03-17	Refers to schedule provided in RFP
	COH04-09	Refers to information provided in testimony
	COH05-05	Refers to confidential WP provided in RFP
	COH05-10	Refers to workpapers provided in RFP
	COH05-23	Refers to information provided in testimony
	COH07-12	Refers to reports provided in RFP
	COH07-17	Refers to information provided in exhibit to testimony
	COH08-17	Refers to information provided in testimony
	COH09-01	Refers to testimony workpapers provided in RFP
	COH11-01*	Refers to documents provided in RFP

COH12-04	Refers to electronic file provided on CD with RFP
COH12-06	Refers to electronic file provided on CD with RFP
COH12-07	Refers to electronic file provided on CD with RFP
COH12-08	Refers to electronic file provided on CD with RFP
COH13-01*	Asks where in RFP information is located
COH18-14	Refers to electronic file provided on CD with RFP
COH18-15	Refers to electronic file provided on CD with RFP
COH18-17	Refers to electronic file provided on CD with RFP
COH20-01*	Refers to documents provided in RFP
GCCC01-05	Refers to schedule provided in RFP
GCCC01-07	Refers to various document provided in RFP
GCCC01-11	Refers to workpapers provided in RFP
GCCC01-26	Refers to information provided in testimony
GCCC02-07	Refers to information provided in testimony
GCCC02-15	Refers to electronic file provided on CD with RFP
GCCC02-16	Refers to electronic file provided on CD with RFP
GCCC02-19	Refers to electronic file provided on CD with RFP
GCCC03-10	Refers to workpapers provided in RFP
GCCC03-13	Refers to information provided in RFP
GCCC03-17	Refers to electronic file provided on CD with RFP
GCCC05-13	Refers to workpapers provided in RFP
GCCC08-14	Refers to electronic file provided on CD with RFP
PUC01-04	Refers to information provided in RFP
PUC01-20	Refers to schedule provided in RFP
PUC01-33*	Refers to information provided in testimony
PUC01-34*	Refers to information provided in testimony
PUC02-01	Refers to electronic file provided on CD with RFP
PUC02-03	Refers to information provided in RFP
PUC02-04	Refers to workpapers provided in RFP
PUC02-09	Refers to workpapers provided in RFP
PUC02-11	Refers to workpapers provided in RFP
PUC02-12	Refers to workpapers provided in RFP
PUC02-13	Refers to electronic file provided on CD with RFP
PUC02-15	Refers to electronic file provided on CD with RFP
PUC03-07	Refers to information provided in testimony
TCUC01-23	Refers to workpapers provided in RFP
TIEC04-02	Refers to electronic file provided on CD with RFP
TIEC06-01	Refers to electronic file provided on CD with RFP
TLSC/TXROSE01-16	Refers to electronic file provided on CD with RFP
TLSC/TXROSE01-25	Refers to information provided in exhibit to testimony
TLSC/TXROSE02-05	Refers to voluminous workpapers provided in RFP
TLSC/TXROSE03-02	Refers to electronic file provided on CD with RFP

RFI Response	Refers To
COH01-10	COH01-09
COH02-01	PUC1-12
COH02-07	PUC01-09
COH02-09	COH02-05, PUC01-27
COH02-13	GCCC02-09
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COH03-12	COH03-11
COH03-13	COH03-11
COH03-14	COH03-12
COH04-10	COH04-09
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COH07-06	GCCC01-22, COH07-07
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COH10-20	COH10-10 and COH10-12
COH11-06U2	COH11-06U
COH11-07U	COH11-06U
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COH19-11	COH19-01
COH19-14	COH05-02
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COH19-18	COH05-03
COH19-23	COH05-03
COH20-02	COH20-01
COH20-03	COH20-01
COH20-04	COH20-01
COH20-05	COH20-01

COH20-06	COH20-01
COH20-07	COH20-01
COH20-11	COH20-01
COH20-13	COH20-01
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COH21-21	COH21-18
COH21-22	COH21-18
COH21-24	COH21-23
COH21-25	COH21-23
COH21-26	COH21-23
COH22-01	COH21-18
COH23-01	COH21-23
COH23-02	GCCC04-29
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COH24-05	COH10-01
COH24-06	COH10-02
COH24-08	COH10-02
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COH25-02	COH21-23
COH25-03	COH21-23
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GCCC01-05U	COH03-16
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GCCC03-16	GCCC11-06
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GCCC05-05	PUC4-3 & PUC4-5
GCCC05-13	COH11-05
GCCC05-14	GCCC05-13
GCCC06-02	GCCC06-01 & GCCC01-05
GCCC06-04	GCCC06-01
GCCC06-05	GCCC06-01
GCCC06-06	GCCC04-23
GCCC06-09	GCCC06-08
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GCCC07-08	GCCC04-24(a) & GCCC07-10c
GCCC07-09	GCCC07-10c
GCCC07-10	PUC04-01 & PUC04-04
GCCC10-02	GCCC10-01
OPC01-08	OPC01-07
OPC01-13	OPC01-12
OPC01-14	OPC01-13
OPC01-15	COH11-01

OPC02-08	COH01-02
OPC03-01	TIEC02-12
OPC03-04	OPC03-03
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PUC01-22	PUC01-21
PUC01-28	PUC01-12
PUC01-29	PUC01-12
PUC01-33	PUC01-32
PUC02-02	PUC02-01
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PUC04-02	PUC04-01
PUC04-06	TIEC01-04
PUC04-09	PUC04-08
PUC05-03	COH10-11
PUC05-04	PUC05-03
PUC09-09	COG02-05
PUC09-10	TIEC05-01
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TCUC01-30	PUC02-01 & TCUC1-23
TCUC01-47	PUC02-13
TCUC01-49	Staff JM-2-1
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TIEC01-05	TIEC01-04
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TIEC02-11	TIEC02-08 and TIEC02-10
TIEC04-03	GCCC01-45 & COH03-01
TIEC04-04	GCCC01-47
TIEC05-03	COH11-01
TIEC06-10	GCCC01-16
TIEC06-18	GCCC04-20 & TIEC06-19
TIEC06-23	TIEC06-22
TIEC06-24	TIEC06-22

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TIEC07-06	TCUC1-04 & 04U, TCUC1-3
TIEC07-10	TIEC07-9
TIEC07-12	COH07-31
TIEC07-14	TIEC07-13
TIEC07-15	TIEC07-13
TIEC07-19	TIEC07-17
TIEC07-20	GCCC01-07
TIEC07-22	TIEC07-16 & TIEC07-21
TIEC07-23	GCCC01-17
TLSC/TXROSE01-01	TLSC/TXROSE01-02
TLSC/TXROSE01-11	TLSC/TXROSE01-02 & 01-03
TLSC/TXROSE01-14	TLSC/TXROSE01-11
TLSC/TXROSE02-17	GCCC04-09
TLSC/TXROSE02-20	TLSC/TXROSE02-17
TLSC/TXROSE03-11	TLSC/TXROSE03-09
TLSC/TXROSE03-13	TLSC/TXROSE03-11
TLSC/TXROSE03-8	TLSC/TXROSE03-7
TSA01-01	TSA01-02
TSA01-07	OPC01-02
TSA01-11	TSA01-12

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
PUC DOCKET NO. 38339
SOAH DOCKET NO. 473-10-5001

CITY OF HOUSTON
REQUEST NO.: COH01-13

QUESTION:

(General) On what date did rates from Docket 32093 go into effect?

ANSWER:

The effective date for rates associated with Docket 32093 is provided in Item 1 of Docket No. 33255 on the PUC's Filing Interchange. This information was also provided to the City of Houston with the initial tariff filing.

Sponsor: Matthew A Troxle

Responsive Documents:
None

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
PUC DOCKET NO. 38339
SOAH DOCKET NO. 473-10-5001

CITY OF HOUSTON
REQUEST NO.: COH02-11

QUESTION:

Please discuss the supply voltage maintained by CenterPoint on distribution circuits and provide documentation of any programs or procedures implemented by the Company in order to reduce or control distribution voltages and therefore reduce energy losses on distribution circuits.

ANSWER:

CenterPoint Houston controls the distribution supply voltage to maintain steady state levels within the ANSI C84.1 limits of ±5% of the nominal service voltages. Voltage regulation is accomplished through the tap changer (or voltage regulator) on the substation transformer, which maintains a consistent voltage regardless of the fluctuating load on the transformer. This control strategy insures adequate voltage on the circuit. Power Factor on distribution circuits is controlled through the use of radio controlled capacitor banks, which cycle on and off as needed based on the individual circuit demands. This helps maintain adequate voltage through the entire circuit and reduces losses under normal operating conditions. Distribution line voltage regulators are also installed on some circuits, when necessary, to help maintain the voltage. The Company has the capability to implement voltage reduction on distribution circuits in order to reduce demand (load) during system emergencies as per ERCOT. This was last utilized in February, 2008, at approximately 12 substations. The load on the system dropped approximately 12.1 MW, but after 35 minutes the load went up 7.4 MW due to the increase in current pulled by motors and compressors. The practice of voltage reduction temporarily reduces demand (load) during system emergencies, and does not reduce losses.

Sponsor: Terry Finley

Responsive Documents:
None

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
PUC DOCKET NO. 38339
SOAH DOCKET NO. 473-10-5001

CITY OF HOUSTON
REQUEST NO.: COH02-12

QUESTION:

Please provide CenterPoint's last three approved system loss studies.

ANSWER:

CenterPoint Houston's last three approved distribution loss factor studies are available on the ERCOT website at http://www.ercot.com/mktinfo/metering/dlfmethodology/. Transmission loss studies are not performed by the Company. They are performed by ERCOT.

Sponsor: Terry Finley

Responsive Documents:
None

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
PUC DOCKET NO. 38339
SOAH DOCKET NO. 473-10-5001

CITY OF HOUSTON
REQUEST NO.: COH03-04

QUESTION:

Provide the working electronic spreadsheet used to produce Chart 3 on page 36 of the Hevert Direct including each of the values used to develop the graphs. Also, provide an updated set of values and chart incorporating the most recent data available.

ANSWER:

Please see the attached "COH03-04 Attachment 1- Chart 3." Mr. Hevert has not performed the requested update. The attachment is voluminous and is being provided in electronic format on CD to the propounding party and are also being made available in the Houston and Austin voluminous rooms. To make arrangements for viewing these documents, please contact Linda Johnston in Houston at (713) 207-5218 or Dolores Prince in Austin at (512) 397-3060.

Sponsor: Robert B. Hevert

Responsive Documents:
COH03-04 Attachment 1 - Chart 3

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
PUC DOCKET NO. 38339
SOAH DOCKET NO. 473-10-5001

CITY OF HOUSTON
REQUEST NO.: COH03-05

QUESTION:

At page 8 of Hevert Direct, Mr. Hevert supports some of his comments regarding the importance of the regulatory environment in which a utility operates by quoting from an August 2009 Moody's publication entitled Rating Methodology: Regulated Electric and Gas Utilities. However, at page 2 of that publication, Moody's says that "this methodology pertains to regulated electric and gas utilities and excludes regulated electric and gas networks (companies primarily engaged in the transmission and/or distribution of electricity and/or natural gas that do not serve retail customers) and unregulated utilities and power companies, which are covered by separate rating methodologies." Please provide a copy of the Moody's publication that explains its rating methodology applicable to regulated electric and gas networks.

ANSWER:

The Moody's publication that explains its rating methodology applicable to regulated electric and gas networks is attached as "COH03-05 Attachment 1 - Moody's Methodology, Reg Electric and Gas Networks." However, please see the attached document "COH03-05 Attachment 2 - Email from Moody's" which confirms that the rating methodology document applicable to the long-term issuer rating for CenterPoint Energy Houston Electric, LLC is "Rating Methodology: Regulated Electric and Gas Utilities," as cited in Mr. Hevert's direct testimony and as provided previously as "GCCC01-45 Attachment 19 - FN6,7,8 Moody's Regulated Electric and Gas Utilities."

Sponsor: Robert B. Hevert

Responsive Documents:
COH03-05 Attachment 1 - Moody's Methodology, Reg Electric and Gas Networks
COH03-05 Attachment 2 - Email from Moody's

www.moodys.com

Rating Methodology

Moody's Global
Infrastructure Finance

August 2009

Regulated Electric and Gas Networks

Table of Contents:

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Team Managing Director

Sydney **61.2.9270.8100**

Clement Chong
Vice President-Senior Analyst

Terry Fanous
Senior Vice President

(Continued on back page)

Summary

This rating methodology explains Moody's approach to assessing credit risk in the regulated electric and gas networks sector. It replaces the Global Regulated Electric Utilities rating methodology that was published in March 2005. While reflecting similar core principles as the March 2005 methodology, this updated framework incorporates refinements that better reflect the dynamics of the regulated electric and gas networks industry and the way Moody's applies its industry methodology.

The purpose of this report is to help issuers, investors and other interested market participants gain a clear understanding of how Moody's assesses credit risk for companies in the regulated networks sector, and to explain how quantitative and qualitative risk factors map to specific rating outcomes. Our objective is for users of this methodology to be able to estimate a company's rating (senior unsecured ratings for investment-grade issuers and Corporate Family Ratings for speculative-grade issuers) within two alpha-numeric notches.

Regulated electric and gas networks are a diverse universe in terms of business model (ranging from owned assets to networks under a licence or concession), level of sophistication of regulatory framework (ranging from well-established to new or undergoing significant changes) and funding structure (ranging from plain corporate structures to highly-leveraged structures supported by structural enhancements). In seeking to differentiate credit risk among the companies in this sector, Moody's analysis focuses on four key rating factors. The four factors encompass 13 specific elements (or sub-factors), each of which map to specific letter ratings (see Appendix A).

These four factors are as follows:

1. Regulatory Environment and Asset Ownership Model
2. Efficiency and Execution Risk
3. Stability of Business Model and Financial Structure
4. Key Credit Metrics

This methodology pertains to predominantly regulated issuers. This methodology excludes regulated vertically integrated utilities, i.e. issuers that are engaged in regulated generation and/or supply to the end-customer in addition to the network business, and that are covered under the Regulated Electric and Gas Utilities methodology (August 2009). North American regulated companies engaged in the transmission of natural gas are also excluded and covered under either the North American Diversified Natural Gas Transmission and Distribution Companies methodology (March 2007) or the North American Natural Gas Pipelines (December 2006). Unregulated utilities and power companies, as well as municipal utilities and electric cooperatives are also covered by separate rating methodologies. Links to all methodologies can be found at the end of this report.

Appendix B includes a detailed rating grid for a sample of 27 companies covered by this methodology. For each company, the grid maps the key rating sub-factors and shows the indicated alpha-numeric grid-indicated rating that results from the overall combination of factors. We also discuss "outliers" – companies whose mapping for specific sub-factors differs significantly from the assigned ratings, since companies will not always perform consistently with their overall rating on every sub-factor.

The purpose of the rating grid is to provide a reference tool that can be used to approximate credit profiles within the regulated networks sector. While the factors and sub-factors within the grid are designed to capture the fundamental rating drivers for the sector, this grid does not include every rating consideration and does not fit every business model equally. Furthermore, most of our sub-factor mappings use historical financial results while our ratings also consider forward looking expectations. As such, the grid-indicated rating is not expected to always match the actual rating of each company. Therefore, we also outline a number of additional considerations that may be appropriate to apply in addition to the four rating factors.

For instance, Moody's analysis considers notching practices for debt subordination. In addition, there are other factors that cut across all industries (such as public versus private ownership, management, liquidity, and legal structure in the corporate organisation), as well as factors that can be relevant on a company-specific basis.

This publication is organised in broad sections as follows:

- **About the Rated Universe**: An overview of the rated regulated networks universe
- **About this Rating Methodology**: A description of our rating methodology, including a detailed explanation of key factors that drive ratings
- **Assumptions and Limitations**: Comments on the rating methodology's assumptions and limitations, including a discussion of other rating considerations not included in the grid

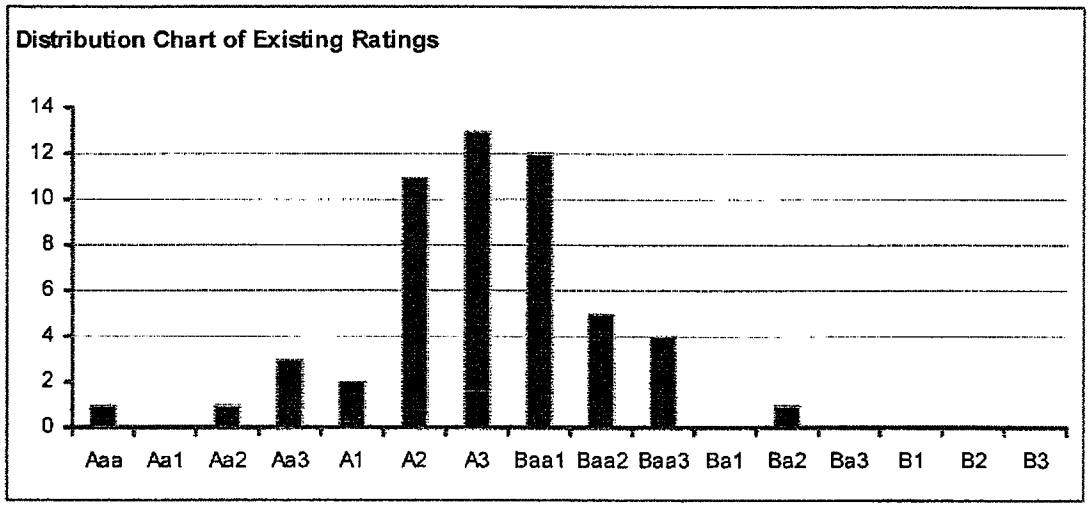
In the appendices, we also provide a discussion of the reasons for the outliers (Appendix C), a table that illustrates the impact on credit metrics of different levels of capital charges (Appendix D), a brief industry overview (Appendix E), and a discussion of key rating issues for the regulated electric and gas networks over the intermediate-term (Appendix F).

About the Rated Universe

This rating methodology covers regulated companies that are primarily engaged in the transmission and/or distribution (T&D) of electricity and/or natural gas. Networks included in this methodology represent a diverse group of issuers differentiated by country of origin, size and scale, regulatory framework, and operating environment. The overwhelming majority of issuers are investment grade, which acknowledges the predictable

Regulated Electric and Gas Networks

and stable nature of the industry. The following chart illustrates the distribution of public ratings in the regulated electric and gas networks sector.



Moody's currently rates 53 issuers that are either regulated electric and gas networks or parent companies thereof. They account for around US$64 billion of total outstanding long-term debt instruments rated. Of the rated universe, the vast majority of issuers are based in Europe or Australia and rated investment-grade. Figure 1 below contains a list of all rated issuers, showing their ratings (together with the Baseline Credit Assessment (BCA) where an issuer is a Government Related Issuer (GRI)), location and amount of rated long-term debt.

Figure 1

Company	Rating [BCA]	Outlook	Domicile	Rated Long-Term debt (US$ billion)
Americas				
Transelec S.A.	Baa3	Stable	Chile	0.5
Asia-Pacific				
Transpower New Zealand Limited	Aa3 [6]	Stable	New Zealand	0.7
SP AusNet [1]	A1	Stable	Australia	2.8
ETSA Utilities Finance Pty Limited	A3	Stable	Australia	0.5
Powercor Australia LLC	A3	Stable	Australia	1.0
SPI (Australia) Assets [1]	A3	Stable	Australia	0.5
ElectraNet Pty Ltd [2]	Baa1	Stable	Australia	0.3
Spark Infrastructure	Baa1	Negative	Australia	0.3
United Energy Distribution Pty Limited	Baa1	Stable	Australia	0.8
Vector Ltd	Baa1	Stable	New Zealand	1.5
Energy Partnership (Gas) Pty Ltd	Baa2	Negative	Australia	0.5
WA Network Holdings [2]	Baa2	Stable	Australia	0.3
DBNGP Finance Co Pty Ltd	Baa2	Negative	Australia	0.8
Envestra Ltd [2]	Baa2	Negative	Australia	0.7
CIS				
FGC UES, JSC (Federal Grid Company)	Baa2 [11-13]	Stable	Russia	-
Kazakhstan Electricity Grid Operating Company	Baa3 [14]	Negative	Kazakhstan	-
MOESK, OJSC [1]	Ba2	Stable	Russia	-

Regulated Electric and Gas Networks

Company	Rating [BCA]	Outlook	Domicile	Rated Long-Term debt (US$ billion)
Europe				
Hovedstadsregionens Naturgas I/S	Aaa [5-7]	Stable	Denmark	0.2
N.V. Nederlandse Gasunie	Aa2 [7]	Stable	Netherlands	5.1
Fingrid Oyj	Aa3 [5]	Stable	Finland	0.6
Statnett SF	Aa3 [7]	RUR Down	Norway	-
Slovensky Plynarensky Priemysel, a.s.	A1 [7]	Stable	Slovak Republic	-
Alliander N.V.	A2 [6]	Stable	Netherlands	2.9
Bord Gais Eireann	A2 [8-10]	Stable	Ireland	0.8
EDF Energy Networks (EPN) Plc	A2	Stable	UK	1.3
EDF Energy Networks (LPN) Plc	A2	Stable	UK	0.8
Enagas S.A.	A2	Stable	Spain	1.4
Red Electrica de Espana, S.A.U.	A2 [6]	Stable	Spain	1.2
REN - Redes Energeticas Nacionais	A2 [8]	Stable	Portugal	1.3
Scottish Hydro-Electric Power Distribution	A2	RUR Down	UK	0.7
Scottish Hydro-Electric Transmission Ltd	A2	RUR Down	UK	-
Southern Electric Power Distribution plc	A2	RUR Down	UK	1.0
Terna - Rete Elettrica Nazionale S.p.A.	A2 [7]	Stable	Italy	4.3
Central Networks East Plc	A3	Stable	UK	-
Central Networks West Plc	A3	Stable	UK	-
EDF Energy Networks (SPN) Plc	A3	Stable	UK	0.6
Northern Electric Distribution Ltd	A3	Stable	UK	0.4
SP Distribution Ltd	A3	Stable	UK	-
SP Manweb plc	A3	Stable	UK	-
SP Transmission Ltd	A3	Stable	UK	-
Yorkshire Electricity Distribution plc	A3	Stable	UK	0.7
National Grid Electricity Transmission plc	A3	Stable	UK	6.5
National Grid Gas Plc	A3	Stable	UK	12.5
CE Electric UK Funding Company [2]	Baa1	Stable	UK	0.3
Northern Gas Networks Limited	Baa1	Stable	UK	1.2
Scotland Gas Networks plc	Baa1	Stable	UK	1.2
Southern Gas Networks plc	Baa1	Stable	UK	3.1
Wales & West Utilities Limited [3]	Baa1	Stable	UK	1.7
Western Power Distribution (South Wales) plc	Baa1	Stable	UK	0.6
Western Power Distribution (South West) plc	Baa1	Stable	UK	0.8
Electricity North West Limited	Baa1	Stable	UK	1.2
Western Power Distribution Holdings Limited	Baa3	Stable	UK	0.4
Transelectrica S.A. [1]	Baa3 [13]	Stable	Romania	-

[1] Corporate family rating

[2] Underlying senior unsecured rating

[3] Senior secured rating

For 19 of the issuers highlighted in Figure 1, some degree of constraint or support from the wider group they belong to is factored into their ratings. Two other issuers (CE Electric UK and WPD Holdings) are holding companies whose ratings are notched for structural subordination. One issuer (Transelec) is undergoing significant changes in its business model as it is transitioning from legacy contracts with Endesa Chile to a mainly regulated tariff driven model according to a framework in place since 2004. Four further issuers

demonstrate historical financials that are not reflective of their current ratings, due to recent corporate activity (e.g. Alliander, Gasunie and Electricity North West) or because we expect a significant reduction in debt levels under the current regulatory settlement (Naturgas). These 26 issuers are thus excluded from the tables in Appendix B that show the outcome of the application of this rating methodology to the rated universe.

About this Rating Methodology

Moody's regulated electric and gas networks consist of the six sections listed below.

1. Identification of the Key Rating Factors

The grid in this rating methodology focuses on four broad rating factors and weightings. The four broad factors are further broken down into 13 sub-factors

Rating Factor/Sub-Factor Weighting

Broad Rating Factors	Broad Rating Factor Weighting	Rating Sub-Factor	Sub-Factor Weighting
Regulatory Environment and Asset Ownership Model	40%	Stability and Predictability of Regulatory Regime	15.00%
		Asset Ownership Model	10.00%
		Cost and Investment Recovery	10.00%
		Revenue Risk	5.00%
Efficiency and Execution Risk	10%	Cost Efficiency	6.00%
		Scale and Complexity of Capital Programme	4.00%
Stability of Business Model and Financial Structure	10%	Ability and Willingness to Pursue Opportunistic Corporate Activity	3.33%
		Ability and Willingness to Increase Leverage	3.33%
		Targeted Proportion of Operating Profit Outside Core Regulated Activities	3.33%
Key Credit Metrics	40%	Adjusted ICR (or FFO Interest Cover)	15.00%
		Net Debt/RAV (or Fixed Assets)	15.00%
		FFO/Net Debt	5.00%
		RCF/Capex	5.00%
Total	**100%**		**100.0%**

The first two factors relate to the fundamental business characteristics of a regulated network. The third factor aims to capture the dimension of credit risk associated with potential changes to an issuer's business or capital structure, which may result from its strategy on corporate activity, diversification and/or financial policies. The fourth rating factor comprises four key financial metrics which we most commonly employ when examining regulated networks.

In addition, the methodology also discusses how the rating of a regulated network can incorporate uplift from structural enhancements that achieve material creditor protection as a mitigant to high debt leverage,[1] or other regulatory or governance features that achieve similar purposes. We have classified each source of rating uplift from creditor protection features into three categories:

> **1. Contractual or legal features that cause a reduction in "event risk"**, the risk that management or owners will change the business or financial profile of an issuer to significantly increase credit risk) is addressed through Factor #3 (Stability of Business Model and Financial

[1] For example, protective clauses in financial documentation and security provisions which typically feature in project financing or structured financings.

Structure) because such features are an overlay upon a view of the management/owners' (current or future) appetite for such risks.

The other two categories of creditor protection are incorporated by a final "rating notching" exercise, potentially moving a rating calculated from the factors up to reflect features that may reduce credit risk. The categories of creditor protection are:

2. Debt structure and liquidity protection

3. Control afforded to creditors

Due to the commonality of creditor protection features in the infrastructure finance markets, we have been able to employ similar categories of creditor protection and valuation logic that we used in our rating methodologies for operational toll roads and airports.

2. Measuring the Key Rating Factors

We present a series of metrics which can be used to quantify the four key rating factors and 13 sub-factors. Many of our metrics consist of ratios and financial data derived from companies' publicly available financial statements; others are approximated based on additional research.

Moody's ratings are forward looking and incorporate our expectations of future financial and operating performance. We use both historical and projected financial results in the rating process. Historical operating results help us understand the pattern of a company's performance and how this performance compares to that of its peers.

This rating methodology utilises historical data, in most cases three-year average performance on a trailing 12 month basis. All of the quantitative credit metrics incorporate Moody's global standard adjustments to the income statement, statement of cash flows, and balance sheet and include adjustments for operating leases. In addition, the balance sheet adjustments include those for recourse off-balance sheet obligations and specific performance lot options.

3. Mapping Factors to Rating Categories

After identifying the measurement criteria for each factor, we provide a chart that maps the sub-factors to specific alpha rating categories (Aaa, Aa, A, Baa, Ba, and B).

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

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

We weight lower rating scores more heavily than higher scores. The reason is twofold. First, we need to adjust for those situations where an issuer exhibits weak characteristics across the first three factors, which are not typically encountered within the rated universe and which would require more demanding thresholds for the credit metrics. Second, we recognise that a serious weakness in one area often cannot be completely offset by a strength in another and that the lack of flexibility normally associated with high degrees of leverage can heighten risk. An overweighting of lower rating categories has been employed in other infrastructure rating methodologies, e.g. those for operational toll roads and airports. We have identical weightings to those for operational toll roads, reflecting our view that both assets demonstrate comparable resiliency to factors that can impact their respective credit profiles.

4. Mapping Issuers to the Grid and Discussion of Grid Outliers

In this section (see Appendix B), we provide a table showing how each company maps within the specific sub-factors. The weighted average of the sub-factor ratings produces a grid-indicated rating for each broad factor. We also highlight companies (Appendix C) whose grid-indicated performance on a specific factor or sub-factor is higher or lower by two or more broad rating categories from the actual rating and discuss general reasons for such outliers with a given factor or sub-factor.

5. Discussion of Assumptions, Limitations, and Other Rating Considerations

This section discusses limitations in the use of the grid to map against actual ratings as well as limitations and key assumptions that pertain to the overall rating methodology.

6. Determining the Overall Grid-Indicated Rating

The mapping outlined above produces a final distribution of scores by rating category (for example: 15% "Aa", 35% "A", 45% "Baa" and 5% "B"). [2] The percentage score in each category is then multiplied by a value determined from the table below to produce a final rating (before adjustment for creditor protection). The final step is simply a mapping exercise.

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

For example (15% "Aa", 35% "A", 45% "Baa" and 5% "B"), the rating score would be 9.46.[3] This weighted average score is mapped to the table below, and a final rating is assigned based on where the score falls in the range (Baa2 in the example).

Indicated Rating	Overall Score
Aaa	1.49 or lower
Aa1	1.50 - 2.49
Aa2	2.50 - 3.49
Aa3	3.50 - 4.49
A1	4.50 - 5.49
A2	5.50 - 6.49
A3	6.50 - 7.49
Baa1	7.50 - 8.49
Baa2	8.50 - 9.49
Baa3	9.50 - 10.49
Ba1	10.50 - 11.49
Ba2	11.50 - 12.49
Ba3	12.50 - 13.49
B1	13.50 - 14.49
B2	14.50 - 15.00

[2] Note that rating scores of lower than A are weighted higher than 1 so that the above % allocations will be after the impact of these rating category weightings.
[3] (0.15 x 3 x 1) + (0.35 x 6 x 1) + (0.45 x 9 x 1.15) +(0.05 x 15 x 3)

Finally, we consider whether the final rating should be adjusted to incorporate uplift from structural enhancements that may be incorporated in the company's financial arrangements (other than pertaining to event risk protection). The effectiveness of any such enhancements is graded to determine the appropriate uplift, as described in the section "Structural Considerations and Sources of Rating Uplift from Creditor Protection" below.

The Key Rating Factors

Moody's analysis of regulated electric and gas networks focuses on four broad factors:

- Regulatory Environment and Asset Ownership Model
- Efficiency and Execution Risk
- Stability of Business Model and Financial Structure
- Key Credit Metrics

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

WHY IT MATTERS

As de facto monopoly providers of essential transmission and distribution services, electric and gas networks falling under this rating methodology are regulated, i.e. their revenues are subject to price control limits reset at periodic reviews. Generally, tariff-setting mechanisms are structured to limit possible volatility in revenues and tend to be highly predictable. In particular, issuers covered by this rating methodology generally benefit from an ex-ante tariff settlement, as opposed to investor-owned utilities in the US that need to seek rate relief after costs have been incurred. In addition to tariff-setting, there are numerous ways that regulatory decisions can affect a network's business position, including a regulator's ability to agree on a capital expenditure programme ex-ante or to set efficiency targets (i.e. achievable cost savings). Finally, the ability to recover prudently incurred costs in a timely manner is one of the most important credit considerations for regulated electric and gas networks, as the lack of timely recovery of such costs may cause financial stress Therefore, the predictability and supportiveness of the regulatory framework in which a network operates is a key credit consideration and the one that differentiates this sector from most other corporate sectors.

In addition, the asset ownership model of an individual network can be significantly different from networks serving similar regions (in terms of size or population) elsewhere in the world. Indeed, the nature of the ownership and/or exploitation rights of the network can vary from full ownership and control of all key assets, through some form of usufruct or concession arrangement, to a short-term lease or licence arrangement that is capable of being terminated relatively easily by the regulator or the licensing authority, hence giving only a short period of time to enjoy the revenue earning capacity of the network. Furthermore, the ability of a company to sell, if necessary, its network without constraint allows substantial operational and capital flexibility, which is most easily achieved where assets are owned outright (although this rarely occurs). We also note that special insolvency regimes may apply. Therefore, the type of asset ownership arrangement will drive the business flexibility of an issuer.

HOW WE MEASURE IT FOR THE GRID

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

a) Stability and Predictability of Regulatory Regime

b) Asset Ownership Model

c) Cost and Investment Recovery (Ability and Timeliness)

d) Revenue Risk

a) 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 regulator's track record for predictability and stability in terms of decision making; and its independence vis-à-vis politicians. This sub-factor is thus comparable to Rating Factor #1: Regulatory Framework of the Rating Methodology for Regulated Electric and Gas Utilities (August 2009), albeit with some differences.[4] A network operating in a stable, reliable and highly predictable regulatory environment will be scored high; those networks operating in a less developed regulatory framework or one that is characterised by a high degree of political intervention in the regulatory process will receive the lowest scores on this factor. The criteria for each rating category are outlined in the factor description within the rating grid.

The scores for this factor replace the classifications we had been using to assess a network's regulatory framework, namely the Supportiveness of Regulatory Framework (SRE) scores, outlined in our previous rating methodology,[5] which we are phasing out. Generally speaking, an SRE 1 score from our previous methodology would roughly equate to "Aaa" or "Aa" ratings in this methodology; an SRE 2 score to "A" or high "Baa"; an SRE 3 score to low "Baa" or high "Ba", and an SRE 4 score to a low "Ba" or "B". Because the cost for the transport of electricity or gas is a relatively small proportion of the total price paid by consumers,[6] the risk of political interference is on average lower for regulated networks than it is for regulated electric and gas utilities, which is partly why the former tend to score higher on this sub-factor than the latter do on the Rating Factor #1: Regulatory Framework of the Rating Methodology for Regulated Electric and Gas Utilities.[7]

In scoring, Moody's also takes into account the overall robustness of institutions and the rule of law in the relevant jurisdiction. Where a network is located in a country with generally poor institutional strength, the score assigned may be decreased from that implied by considering only the regulatory regime under which it operates.

b) Asset Ownership Model

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

A company that owns all key network assets outright in perpetuity and has control over them would score the highest rating ("Aaa"), and a company that held its key assets under a short-term operating lease or licence type arrangement would score a low rating ("B"). Issuers with concession agreements or more permanent licences would score somewhere in between these ratings depending on (i) the nature of events that could cause a loss of concession or licence and (ii) the timeframe thereof.

4 In this sub-factor, we do not capture considerations relative to regulatory ring-fencing provisions (such as restrictions on dividends, restrictions on capita expenditures and investments, separate financing provisions, separate legal structures, limits on the ability of the regulated entity to support its parent company in times of financial distress, etc). These potential features of a regulatory framework are addressed in this rating methodology by the Rating Factor #3 and its sub-factors.

5 Global Regulated Electric Utilities, March 2005.

6 For example, the UK electricity and gas regulator, Ofgem, estimated in January 2008 that transmission accounted for 2% and 4% of gas and electricity bills respectively; distribution represented 20% and 17% of gas and electricity bills, respectively. Energy, supply costs and margin therefore accounted for the bulk of gas and electricity prices (68% and 66%, respectively, according to Ofgem).

7 In addition, these sub-factors need to be seen in the overall context of their respective methodologies, which may also result in different scores.

c) Cost and Investment Recovery (Ability and Timeliness)

This sub-factor focuses on the supportiveness of the regulatory framework, i.e. the extent to which the regulatory formula is conducive to supporting cost recovery. In other words, it measures the risk allocation between the network operator and its final customers. Prevalent regulatory models for unbundled networks across the world are "ex-ante", either "cost-plus" or "incentive-based". A cost-plus regime is generally characterised by automatic cost recovery or pass-through provisions, whilst operating and financial costs are subject to analysis and benchmarking at price review under incentive-based regulation. Moody's will thus assess a regulator's willingness[8] to keep the volatility and the uncertainty associated with operating and financial costs with the company or to pass these on to consumers (e.g. balancing costs are borne by the electricity transmission grids in Germany whilst the commodity price risk associated with shrinkage gas[9] is a pass-through for gas distribution networks in the UK).

Networks that have complete flexibility to set tariffs so that they can meet current and future operating and capital costs without impediment will score "Aaa". A network that benefits from fair and timely cost and investment recovery but is subject to efficiency targets would score "A". Where there is tendency for a regulator to challenge cost recovery or some history of disallowance or delays in some costs, a network would likely receive a "Baa" rating for this factor. Where there is a history of unfavorable price reviews or a highly uncertain cost recovery environment, lower scores for this factor would apply.

d) Revenue Risk

In this sub-factor we turn to the actual mechanics of revenue generation for the network. In general, revenues earned by networks are driven by volumes and tariff levels. Whilst we discussed tariff-setting mechanisms in the previous sub-factor, this sub-factor focuses on the volumes transported by a network as a driver of potential volatility and uncertainty in future revenues. As a general rule, we believe that transmission tends to be less volatile than distribution due to its wider geographic outreach (e.g. volumes are arguably more stable and predictable where exposed to a country's entire economy vs. a subset thereof). From a commodity perspective, gas is likely to be more exposed to weather conditions than electricity. However, there is ultimately no direct link between volumes volatility and credit risk as some regulators may want to mitigate such risk.[10]

Issuers will thus score "Aaa" if their revenues are not linked to volumes transported (i.e. regulated tariffs apply to network capacity used, on a "ship-or-pay" basis). Networks will score "Aa" or "A" if they are sheltered from volume risk by regulatory mechanisms based on revenue caps (as opposed to price caps) that allow the adjustment of unit prices to reflect volume changes and the recovery of revenue losses due to drops in volumes of electricity and gas transported compared with the levels assumed in regulatory settlements.[11] We will score all other situations "Baa" through to "B" depending on the potential volatility of revenues. We will also take into account a network's reliance on revenues associated with new connections. Whilst 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.

RATING GRID MAPPING

The following table shows the full mapping of each sub-factor to a broad rating category and the weighting of each sub-factor within Rating Factor #1.

[8] Ability is captured under the first sub-factor of Rating Factor #1 Stability and Predictability of Regulatory Regime.
[9] The gas lost from the system by leakage, theft or own use.
[10] An example of such behavior is that of the UK gas regulator, the Office of Gas & Electricity Markets ("Ofgem"), which changed the tariff formula during the 2008 Gas Distribution Price Control Review so as to increase to 95% (from 50% previously) the proportion of revenues collected from capacity charges (where tariffs are charged for the share of the pipeline capacity based on the daily peak transported to a supply point).
[11] "Fundamental" revenue risk is actually similar under rating categories "Aaa" to "A", as it is assumed to be covered in all cases by such correction factor aimed at offsetting on an NPV-neutral basis the potential mismatch between allowed and collected revenues. However, the existence of commodity charges (which vary with volumes transported) as opposed to capacity charges (as described above) adds some degree of seasonality and, in turn, liquidity risk, which we capture by scoring companies in one of the three aforementioned rating categories.

Regulated Electric and Gas Networks

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

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) Stability and Predictability of Regulatory Regime	Regulation is independent, well established (>15 years of being predictable and stable) and transparent (published methodologies clearly define risk allocation between companies and customers and are consistently applied, with public or shared financial model)	Regulation is independent, reasonably well established (>10 years of being predictable and stable) and transparent (published methodologies clearly define risk allocation between companies and customers and are generally consistently applied)	Regulation is generally independent and developed (published methodologies set out principles of risk allocation between companies and customers and are based on established precedents in the same jurisdiction)	Regulatory framework is relatively new and untested, but methodologies are based on established precedents and jurisdiction has a history of independent and transparent regulation for other utility services	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	Regulatory framework is unclear, untested or undergoing significant change, with a history of political interference	15.00%
b) Asset Ownership Model	All key T&D assets held outright in perpetuity	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	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%)	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%)	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%)	Key T&D assets held under short-term operating leases or management contracts (limited portfolio diversification)	10.00%
c) Cost and Investment Recovery (Ability & Timeliness)	No regulatory or contractual impediment to adjust tariffs (no approval or reviews required)	Tariff formula allows for timely recovery of operating expenditure including depreciation, electricity losses and balancing costs/shrinkage gas and a fair return on all investment Depreciation allowance fairly reflects asset consumption All capital expenditure is included in asset base as incurred	Tariff formula allows 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 Depreciation allowance fairly reflects asset consumption Capital expenditure is included in asset base as incurred	Tariff formula allows 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	Tariff formula does not 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 allow coverage of most operating expenditure but	Tariff formula does not 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 only partially cover cash operating expenditure	10.00%

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

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
			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)	Some instances of revenue back-loading (e.g. depreciation allowance set below asset consumption or operating expenditure is capitalised)	investment is not clearly or fairly remunerated		
d) Revenue Risk	No exposure to volume risk: collected revenues based on capacity charges	Little exposure to volume risk: collected revenues based on volume charges but revenue cap (existence of timely recovery mechanism)	Limited exposure to volume risk: revenue cap with collected revenues based on volatile volumes OR hybrid/price cap with low volatility in volumes	Moderate exposure to volume risk: hybrid/price cap with moderate volatility in volumes OR Some reliance on connection revenues	Material exposure to volume risk: price cap with significant volatility in volumes OR Material reliance on connection revenues	High exposure to volume risk: price cap with substantial volatility in volumes OR Very high reliance on connection revenues	5.00%

Rating Factor #2: Efficiency and Execution Risk (10%)

WHY IT MATTERS

Whilst Rating Factor #1 focused on the general business model and regulatory environment under which a network operates, Factor #2 assesses a network's individual performance within its regulatory framework and the execution risk associated with its specific regulatory settlement. Indeed, the growing convergence of the various regulatory regimes – especially in Europe – from cost-plus towards incentive-based frameworks is likely to result in increasingly more challenging cost efficiency targets. The ability of a network to outperform its regulatory targets is thus a key driver of long-term value creation for its stakeholders.

In addition, given the secular trend of global energy consumption growth and environmental concerns, most networks have large capital investment programmes to connect new generation plants and to improve interconnections and the overall security of the system. Many companies also have substantial replacement needs for their ageing grids. For most networks, a sizeable capital expenditure programme is thus a constant feature of their business model. To some extent, the size of a network's capital expenditure plans can be correlated to the complexity of the programme, particularly for material capacity increase or technically challenging projects. However, this may not be the case for replacement programmes that tend to present limited execution risk. The more complex the capital expenditure programme, the greater the likelihood that it may take longer than envisaged and could cost more. Also, the cost overruns associated with such outcomes may not be recoverable from future revenues, depending on the regulatory framework.

HOW WE MEASURE IT FOR THE GRID

To measure this factor, we examine the following two sub-factors:

a) Cost Efficiency

b) Scale and Complexity of Capital Programme

a) Cost Efficiency

Moody's assesses the ability of a network to meet on a sustainable basis its efficiency targets in terms of operating expenditure, capital expenditure and cost of capital. Moody's pays particular attention to sustainability, as short-lived outperformance is unlikely to improve materially the position of a network: generally, regulators have a duty to protect the interests of consumers by passing through efficiencies over time. In addition, short-lived performance may be captured by Rating Factor #4: Key Credit Metrics, as it flows into actual financial ratios, whilst this sub-factor aims at capturing the out- or under-performance that fundamentally enhances or reduces the value of a regulated business (e.g. because of a structurally better position relative to peers or through future regulatory settlements that will factor in historical efficiency via either benign or otherwise challenging revised targets).

As monopoly providers of essential transmission and distribution services, regulated electric and gas networks are also subject to a number of targets relative to operational efficiency, which are generally part of their licence conditions.[12] Under this sub-factor, however, we only assess the cost efficiency of a regulated network as opposed to its operational efficiency. Operational efficiency is not captured by any of the rating factors for two reasons. First, failure by a regulated network to meet basic operational standards may put its licence at risk and potentially trigger a regulatory intervention, which we believe would be such a severe event that it could have an overriding impact on the ratings and hence is best captured outside of this methodology grid. Secondly, it is common that a network would generally achieve the targets set by the regulator without necessarily over-performing as the cost/reward incentive may not be highly attractive.

Issuers will score "Aaa" to "B", depending on their sustainable cost performance relative to the regulator's assumptions. Networks consistently and materially outperforming regulatory assumptions – as is generally the case of Australian issuers in terms of cost of capital – will score "Aaa" through "A". A network that is generally meeting regulatory assumptions will score "Baa". We will score other situations "Ba" or "B", although we would expect few instances thereof.

b) Scale and Complexity of Capital Programme

Moody's makes an assessment of a regulated network's capital expenditure programme by considering (i) the size of this capex programme relative to the issuer's asset base (expressed in percentage of its Regulatory Asset Value or total fixed assets), and (ii) the complexity of this capex programme, i.e. the type of assets to be built and associated technical issues (e.g. offshore transmission) as well as the relative concentration of challenging projects within the issuer's total capex programme.[13] Please note that, within this rating methodology, Moody's considers capital expenditure that may not be related to the network infrastructure. Although such activities would generally not directly prejudice the network operations due to ring-fencing provisions, material investments outside of the core regulated business may impair debt service or cause a significant drain on management's time and resources.

Issuers will score "Aaa" through "B", depending on the size of their capital programme measured in terms of annual total capital expenditure (including both maintenance and enhancement spend, gross of any subsidies) as a percentage of total net fixed assets or regulated asset base. A network with one large and complex project accounting for the majority of its capital programme will also score "B" regardless of the relative scale thereof.

RATING GRID MAPPING

The following table shows the full mapping of each sub-factor to a broad rating category and the weighting of each sub-factor within Rating Factor #2.

[12] These targets cover areas such as safety, customer satisfaction, network reliability (measured by the total number of customer interruptions and the average number of minutes lost per customer per annum), restoration of supplies after disruption within a prescribed timeframe, etc.

[13] Note that there is a distinction between the risk characteristics captured under this sub-factor and those captured by the RCF / Capex ratio in Factor #4: Key Credit Metrics. Under this sub-factor, we assess the execution risk associated with a potentially large capital expenditure programme, which may in turn weaken financial metrics in case of delays or cost overruns. Conversely, under Factor #4, we assess the risk that a large capital programme may have on an issuer's financial flexibility by potentially raising external funding requirements.

Factor 2: Efficiency And Execution Risk (10%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) Cost Efficiency	Track record of very high performance vs. regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Track record of high performance vs. regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Track record of outperforming regulator's assumptions / above benchmarks across regulatory periods on key measures (e.g. WACC, opex, capex)	Performance in line with benchmarks / regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Below benchmarks / regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Poor track record across regulatory periods on key measures (e.g. WACC, opex, capex)	6.00%
b) Scale and Complexity of Capital Programme	Annual total capital expenditure (maintenance & enhancement) ≤ 4% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 4% ≤ 6% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 6% ≤ 8% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 8% ≤ 12% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 12% ≤ 20% of total fixed assets or regulated asset base OR Small number of large and complex projects accounts for majority of capital programme	Annual total capital expenditure (maintenance & enhancement) > 20% of total fixed assets or regulated asset base OR One large and complex project accounts for majority of capital programme	4.00%

Rating Factor #3: Stability of Business Model and Financial Structure (10%)

WHY IT MATTERS

The generally highly stable and predictable cash flows of a regulated network create significant capacity to incur debt financing and potentially to invest in related businesses. Moody's understands that debt financing may be considered essential to the efficient capital structure of a privately-owned network. However, a desire to enhance shareholder returns may lead to the pursuit of higher leverage. Furthermore, sustained investment outside of the ownership of the core domestic regulated business may undermine the quality of the cash flows generated by the core network assets. Therefore, the way in which a network owner chooses to use debt capacity, and the limitations on leveraging and the pursuit of other activities (whether statutory or contractualised with debt holders), are considered key credit issues. In the case of certain GRIs, such activities may not be legally possible or may be outside of an entity's mandate, which should be recognised in ratings.

This factor aims to identify the likelihood that current or future management action could add uncertainty to future cash flow levels and divert resources away from creditors. Such decisions are a function of the ability and willingness of management and shareholders to change the business focus and the financial structure of the company.

HOW WE MEASURE IT FOR THE GRID

To measure this factor, we examine the following three sub-factors:

a) Ability and Willingness to Pursue Opportunistic Corporate Activity (M&A, Disposals and Investments)

b) Ability and Willingness to Increase Leverage

c) Targeted Proportion of Operating Profit Outside Core Regulated Activities

a) Ability and Willingness to Pursue Opportunistic Corporate Activity

In this sub-factor we consider whether there are restrictions on management's discretion to exploit an issuer's cash flows to pursue opportunistic investments, business combinations, and other significant corporate initiatives that would alter the issuer's credit profile. In essence, we assess how future cash flows are likely to be applied, and what the balance will be between cash flows applied to repay debt creditors and those applied to make investments to bolster shareholder returns.[14]

The best possible feature scored under this sub-factor (which we deem commensurate with the "Aaa" category) entails a prohibition on the issuer from engaging in any form of opportunistic corporate activity, either because of the specific mandate incorporated into the licence, the company's by-laws, or other binding agreements (e.g. a contract with a government), or because of express covenant restrictions in financing agreements. We will score all other situations "Aa" through "B", depending on management's appetite for opportunistic corporate activity.

b) Ability and Willingness to Increase Leverage

This sub-factor specifically addresses the likelihood that a company may change its capital structure, based on the degree of discretion left to management and shareholders, their strategy and their track record. It is not intended to penalise issuers that may need to raise debt to fund capital expenditure programmes. Issuers will score either "Aaa" or "Aa" if they have some contractual, legal or regulatory framework that prohibits the raising of debt for the purposes of altering the capital structure. Issuers will score "A" if their debt documentation contains financial covenants that would limit management's ability to increase leverage materially, and would score between "Baa" and "B" if there are no specific protections for creditors, with the scoring determined by how conservative or aggressive the issuer's financial strategy is expected to be. For example, a company with a conservative financial strategy that, in incurring additional indebtedness, would not compromise pre-advised minimum financial parameters would score "Baa" for this sub-factor.

There is a distinction between the risk characteristics captured under Rating Factor #3 and those considered in Rating Factor #4: Key Credit Metrics. Under Rating Factor #4, we assess an issuer's prospective financial profile based on its stated business plan and financial policies and on our views of the main variables affecting future cash flow generation (e.g. revenues, costs, capital expenditure). Any specific transaction that an issuer is committed or very likely to execute would be factored into our financial projections. Conversely, under Rating Factor #3, we assess the risk that current financial policies will be abandoned in pursuit of higher financial leverage.

[14] The nature of the network's shareholders is not addressed directly in this rating methodology. Rather, the intentions and priorities of shareholders are what may affect how we score this particular sub-factor. This sub-factor can be particularly important in situations where shareholder structures are in flux. For example, a shift towards private ownership may also entail more focus on enhancing shareholder returns. However, a government-owned issuer may also be subject to high event risk if the government is seeking to extract dividends from the network to apply to national budget considerations. Where an issuer is a GRI, these factors are addressed in our rating methodology, "The Application of Joint Default Analysis to Government Related Issuers", April 2005.

c) Targeted Proportion of Operating Profit Outside Core Regulated Activities

This sub-factor is designed to adjust for the influence that contributions from higher-risk businesses may have on an issuer's financial performance and credit metrics. Shareholder returns may be enhanced by investing in activities outside the core regulated business, with higher return expectations (e.g. a telecoms business utilising the network's geographic coverage; a network in a less transparent or supportive regulatory environment). Such investments typically entail higher risk and we generally view substantial investments outside the core regulated network business as a credit negative.

Issuers will score either "Aaa" or "Aa" if they are subject to some contractual, statutory or regulatory restrictions that prohibit investments outside the core regulated business. We will score all other situations "A" through "B", depending on management's appetite for investment in non-core businesses as measured in terms of the expected future proportion of operating profit that may be earned from such investments (measured as a percentage of total operating profit).

Within the rating grid, the lowest possible score is attributed to a company targeting over 20% of operating profit originating outside its regulated business. If the company targets more than 20% of operating profit originating outside the core regulated business, the actual credit analysis tied to the company may require a "blended" approach of the different businesses to adequately assess its consolidated credit profile.

A Note on Applying Rating Factor #3 to Structured or Project Financings

As noted in the introductory remarks to this report, this rating methodology is applicable to any regulated network, regardless of its chosen financing strategy.

For financings that employ techniques that have been variously described as "project finance" or "structured finance", management and shareholder discretion is generally subject to restrictive covenants. In these cases, the extent of creditor protection and the behavioural limitations placed on the issuer by credit documentation are such that management and shareholders' discretion are restricted, and objectives are more closely aligned to those of the debt holders. Because the terms and conditions of credit documentation may add a substantial layer of debt holder protection, we discuss the credit benefits of such financing structures more generally in the section entitled "Sources of Rating Uplift from Creditor Protection" below. Nevertheless, the company will still be scored under this Factor, as the debt holder protection features of such financings pertaining to "event risk" protection are captured by this factor. As discussed in further detail later in this report, where we deem that event risk protection (as determined by credit documentation) is exceptionally strong, we would score all sub-factors in the "Aaa" category.

RATING GRID MAPPING

The following table shows the full mapping of each sub-factor to a broad rating category and the weighting of each sub-factor within Rating Factor #3.

Factor 3: Stability Of Business Model And Financial Structure (10%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) Ability and Willingness to Pursue Opportunistic Corporate Activity (M&A, Disposals & Investments)	Covenants prohibit all corporate activity OR Corporate activity is outside of management mandate	Covenants or licence/concession largely limit corporate activity, with exception of certain defined permitted investments	Strong track record of no material corporate activity and stated intention to refrain from M&A and major investments OR Regulatory restrictions but residual exposure to affiliates	Moderate, may impact credit metrics for 18-24 months only	Track record of repetitive, sizeable transactions	Highly likely to conduct frequent and very large opportunistic investments	3.33%

Factor 3: Stability Of Business Model And Financial Structure (10%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
b) Ability and Willingness to Increase Leverage	No additional indebtedness allowed without debt holders' consent	Additional indebtedness only allowed for capex under debt covenants and/or licence/concession terms	Financial covenants in principal debt instruments limit management ability to materially increase leverage	Conservative financial strategy, unlikely to compromise minimum financial parameters	Limited track record of consistent financial policies; likely to target high leverage	Track record of aggressive financial policies and very high leverage; likely to pay out creditors' financial cushion ahead of business pressures	3.33%
c) Targeted Proportion of Operating Profit Outside Core Regulated Activities	0% (Exclusive focus on core T&D activities) OR Covenants prohibit all other businesses	0-5% OR Covenants largely limit unregulated businesses, with exception of certain defined and low risk permitted businesses	5-10%	10-15%	15-20%	>20%	3.33%

Rating Factor #4: Key Credit Metrics (40%)

WHY IT MATTERS

The first three rating factors aim to capture the credit strengths and weaknesses afforded by the network's fundamental business and its financial policies. However, a company's ultimate credit profile must also incorporate its financial metrics, as a network with substantially more debt than its peers relative to the value of its asset base will generally have a higher probability of default.

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

HOW WE MEASURE IT FOR THE GRID

We use four key credit metrics when examining a regulated network. Importantly, when examining credit metrics, our ratings also incorporate our "expected case", i.e. how we believe the metrics will evolve over the foreseeable future. The four credit metrics we examine for this factor are:

a) Adjusted Interest Cover Ratio ("Adjusted ICR") or FFO Interest Cover

b) Net Debt/Regulatory Asset Value ("RAV") or Fixed Assets

c) FFO/Net Debt

d) RCF/Capex

These credit metrics also incorporate all of the standard adjustments applied by Moody's when examining financial statements,[15] including adjustments for certain types of off-balance sheet financings and certain other re-classifications in the income statement and cash flow statement. Specific accounting considerations apply in a limited number of cases.[16]

a) Adjusted ICR or FFO Interest Cover

The Adjusted ICR is a variation on the FFO Interest Cover ratio but with a meaning closer to EBIT coverage. Moody's believes that EBITDA- or FFO-based interest cover ratios are inferior indicators of the ability and flexibility of regulated networks to meet their debt service commitments because differences in Capital Charges (as a percentage of the RAV) result in a lack of true comparability across regulatory models, as demonstrated in Appendix D. However, where not available or not appropriate, Moody's will use the standard FFO Interest Cover.

The formula for the Adjusted ICR is as follows:

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

The starting point in the numerator is Funds From Operations ("FFO"), which reflects Cash Flows From Operations ("CFO") excluding working capital movements, plus net interest expense. FFO is a relevant measure of cash flows for networks, since working capital movements for a regulated business are typically not material; any unusual movements in working capital tend to be small one-off movements tied more to normal operating activities than to any strategic decisions. For a regulated network, we believe that using FFO therefore allows us to "normalise" CFO.

The concept of Capital Charges looks at the portion of revenues (and thus FFO) that is not available to cover interest because it needs to be allocated to replenishing the asset base/maintaining the economic value of the assets. Depending on the regulatory financial model (for example, whether based on statutory financial statements or regulatory current cost financial statements), Capital Charges could correspond to regulatory depreciation, accounting depreciation, maintenance expenditure or an equivalent concept.[17]

The denominator in the formula is net interest expense, based on the issuer's reported figures and incorporating our standard adjustments to interest expense (for example, re-classifying the interest component of operating lease rental expense). Where relevant, non-cash interest is deducted in the context of the relevant regulatory financial model to capture the basic financial flexibility that an issuer has in meeting interest payments due on its debt. For example, this approach is used for those regulated networks that have a material portion of their debt funding in the form of non-conventional instruments, such as index-linked debt positions that better align the debt service profile to cash flows under the relevant regulatory model.[18]

[15] See Moody's Rating Methodology: Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part II Standardized Adjustments to Enable Global Consistency for Issuers Reporting under International Financial Reporting Standards ('IFRS'), February 2006, and Rating Methodology: Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part I Standardized Adjustments to Enable Global Consistency for US and Canadian GAAP Issuers, February 2006.

[16] For example, in the UK gas distribution sector, replacement expenditure (which relates to a 30-year programme launched in 2002 to replace all metallic gas mains with polyethylene pipes within 30 meters of premises in order to reduce incidents originating from the mains) is expensed under UK GAAP and capitalised under IFRS. For those issuers that report under UK GAAP, Moody's would capitalise replacement expenditure when computing key credit metrics such as FFO/Net Debt and RCF/Capex.

[17] Depending upon the regulatory financial model, there may thus be no direct link between Capital Charges and the capex required to maintain the physical integrity of a network. However, these charges should be broadly equivalent over the long term to maintenance requirements.

[18] For example, index-linked debt has been principally used by UK regulated electric and gas networks whose financial model is based on a real rate of return on their regulatory asset base and an indexation of the asset base (i.e. fully inflation-adjusted revenues).

b) Net Debt/RAV or Fixed Assets

This ratio is designed to provide a comparable measure of leverage among networks under different regulatory regimes. The debt quantum of a regulated network is assessed in relation to its Regulatory Asset Value ("RAV"), which is the capital base upon which a regulated network earns a return set by the regulator.[19] Assuming a network performs in line with the regulatory assumptions, the RAV represents the net present value of the future free cash-flows of the regulated business given a discount rate equivalent to the weighted average cost of capital (WACC) allowed by the regulator. Thus, the RAV is a proxy for the long-term average enterprise value of a regulated business – the Net Debt-to-RAV ratio is essentially equivalent to a loan-to-value ratio.

The RAV is a regulatory concept quantifying the capital invested by the providers of capital, both debt and equity, and it may not have a direct relationship with the actual replacement value of the networks and other assets owned by the companies. The denominator for this ratio can therefore be a similar concept to the RAV, e.g. it can be Total Fixed Assets, or Book Capitalisation or similar measures derived from the statutory financial statements when these are used to assess the capital invested on which the company is allowed to earn a return.

We prefer to use a measure of net debt for this sector, as most networks – particularly in Europe – typically carry large amounts of cash balances earmarked to meet debt maturities and/or capital expenditure in subsequent financial years. This funding policy is driven by the visibility companies have over their capital programme, which is generally agreed ex-ante with the regulator for the entire regulatory period. However, in situations where this assumption may be incorrect or where the debt position of the company may be overstated or understated by the debt figures as reported in the financial statements, we make the appropriate adjustments.[20]

c) FFO/Net Debt

This ratio is one of Moody's most commonly used dynamic leverage measures. Although it is not a highly relevant metric to benchmark regulated networks operating under very different regulatory financial models (see Appendix D), its development over a certain period of time gives useful information as to the ability of a company to generate sufficient cash flow to cover future debt repayments.

The numerator in this ratio is FFO as defined above.[21] The denominator is Moody's calculation of net debt, i.e. reported debt plus Moody's adjustments (e.g. pensions, operating leases and other off-balance sheet adjustments) less unrestricted cash and cash equivalents. As indicated above, we generally use a measure of net debt for this sector.

d) RCF/Capex

This ratio shows whether a network is able to fund capital expenditure internally. Moody's does not regard capital expenditure undertaken by an issuer to upgrade and/or expand its network as a negative rating factor in itself, as additional investments should be remunerated through increased revenues. However, we view positively the financial flexibility enjoyed by a network owner that faces only limited capex requirements easily funded by internally generated cash flows. Such a company would not need to access the markets to raise additional finance and may have a wider range of options to react to changing regulatory assumptions (e.g. reduction in the cost of capital allowed). Conversely, a company that faces a large capital programme is likely to have a limited degree of financial flexibility if it further makes large distributions to shareholders that management is unwilling to cut.

[19] Depending upon the regulatory regime, it may also be called Regulated Asset Base ("RAB") or Regulatory Capital Value ("RCV").
[20] The most common instances where such an adjustment may arise are linked to derivative transactions.
[21] As FFO is post interest expense, it will have the benefit of indexation where such adjustment is made in the context of the relevant regulatory model.

The formula for the RCF/Capex ratio is the following:

$$\frac{\text{FFO} - \text{Dividends Paid}}{\text{Capex}}$$

Capex comprises additions to both tangible and intangible fixed assets, net of subsidies.

Due to the large capital programmes required to upgrade ageing assets, we would expect to score this credit metric in the "Ba" category for most regulated networks with the exception of UK electricity distribution companies that benefit from accelerated depreciation.

Historical vs. Projected Credit Metrics

Given that the regulated networks generally have good visibility a few years into the future, financial projections often provide a reliable and useful tool to enhance credit analysis. In mapping a company's credit metrics to broad rating categories as indicated in the grid below, we could focus exclusively on historical credit metrics or exclusively on projected metrics, or use a mixture of both. In actual fact, we use historical credit metrics in situations where we believe that these are representative of the financial structure pursued by management (based on a track record), or where we believe that forecast improvements are uncertain.

For companies that have a history of using financial headroom to increase distributions to shareholders, we map using historical credit metrics, without factoring in the benefit of any reduction in leverage and associated improvement in credit metrics that may be shown in the financial projections based on current operations. Conversely, in cases where we believe that there is a high probability that a company's credit metrics will improve (e.g. an agreement with the regulator) or deteriorate (e.g. a large capital programme), we map using the prospective ratios.

RATING GRID MAPPING

The following table shows the full mapping of each sub-factor to a broad rating category and the weighting of each sub-factor within Rating Factor #4.

Factor 4: Key Credit Metrics (40%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) 3-yr Adjusted Interest Cover Ratio	≥6.0x	≥4.0x - 6.0x	≥2.0x - 4.0x	≥1.4 - 2.0x	≥1.1 - 1.4x	<1.1x	
OR	OR	OR	OR	OR	OR	OR	15.00%
3-yr FFO Interest Cover	≥7.0x	≥5.0 - 7.0x	≥3.5 - 5.0x	≥2.5 - 3.5x	≥1.5 - 2.5x	<1.5x	
b) 3-yr Net Debt/Regulatory Asset Value (or Fixed Assets)	≤30%	>30 - 45%	>45 - 60%	>60 - 75%	>75 - 90%	>90%	15.00%
c) 3-yr FFO/Net Debt	≥30%	≥20 - 30%	≥12 - 20%	≥8 - 12%	≥4 - 8%	<4%	5.00%
d) 3-yr RCF/Capex	≥3.5x	≥2.5 - 3.5x	≥1.5 - 2.5x	≥1.0 - 1.5x	≥0.5 - 1.0x	<0.5x	5.00%

Structural Considerations and Sources of Rating Uplift from Creditor Protection

Networks may be funded under different financing structures. In the recent past, infrastructure borrowers have become more highly leveraged as a result of changes in ownership and other corporate activity, and may have to agree to creditor protection arrangements to insulate the regulated business against potential acquisition debt located at holding company levels. For example, this was the path followed by Wales and West Utilities Limited in 2005 following its acquisition by a Macquarie-led consortium.

Regulated Electric and Gas Networks

Moody's believes that in the infrastructure sector in general, and in the regulated electric and gas network sector in particular, structural enhancements provided to financial creditors may provide valuable protection and be a source of rating uplift when compared to those issuers that do not grant such protections. These factors were recognised and articulated within a debt rating framework in Moody's rating methodologies for operational toll roads and operational airports outside the US. Moody's has employed the same factors in the same way within this rating methodology. The defined sources of ratings uplift, their potential characteristics and their measurement are identical in the three methodologies and are as set out below.

We have classified the sources of rating uplift from creditor protection into three categories:

a) Event Risk Protection

b) Debt Structure and Liquidity Protection

c) Control Afforded to Creditors

The first category is assessed as part of Factor #3. For the second and third categories, we look at specific concessions made to creditors and score their effectiveness on a scale of five grades: "none"; "low"; "medium"; "high"; and "very high". Each grade is worth a fraction of or a whole rating notch ("none" = 0%; "low" = 25%; "medium" = 50%; "high" = 75%; and "very high" = 100%). In terms of the modelled output, the sum of the scores of the two categories is then rounded to produce 0, 1, or 2 rating notches of uplift.

Debt structural features will be assessed in the context of the legal jurisdictions relevant to the issuer, as the value of certain contractual arrangements (e.g. security) may vary from jurisdiction to jurisdiction.

a) Event Risk Protection

In this category, we typically review restrictive covenants including:

i. Restrictions on permitted business outside the core regulated business

ii. Restrictions on acquisitions/disposals

iii. Restrictions on investments

iv. Restrictions on additional indebtedness

As we have discussed in "Rating Factor #3: Stability of Business Model and Financial Structure" above, if these and similar restrictions are fully effective to remove event risk, all the sub-factors under Rating Factor #3 will be scored "Aaa". This could effectively provide a one-notch uplift to an issuer benefiting from such enhancements.

Project and other structure financings typically incorporate ring-fencing provisions designed to insulate the credit quality of the network from that of its wider corporate family or shareholders. These provisions may be crucial in order for the rating of the network to reflect exclusively its credit quality, assessed as described in this rating methodology. However, they do not enhance the network's stand-alone credit quality and therefore are not listed as a source of rating uplift.

b) Debt Structure and Liquidity Protection

Structural enhancements in this category address financial risks associated with liquidity, interest rate and refinancing risk. Typical arrangements include:

i. Dedicated cash reserves to cover specific costs, for example liquidity facility covering scheduled interest payments, often for the next 12 months

ii. Timing reserves to cover future "lumpy" payments (e.g. operating and maintenance facility)

iii. No material refinancing risk (e.g. benefits of amortising debt)

iv. Covenanted hedging policies

The different arrangements above may have different levels of bearing on our assessment of the effectiveness of creditor protection in this category, depending on the specific circumstances of the issuer. A fully amortising debt structure, typical of project financings and typically associated with adequate reserving and hedging arrangements, is generally regarded as necessary to achieve a score of "very high" in this category. As regulated networks usually need to continue to renew their assets, a financing structure that provides for the amortisation of the overall debt is generally difficult to implement. Refinancing risk thus tends to be a constant feature of all network financing approaches.

c) Control Afforded to Creditors

Among the most typical structural features, financial covenants and security arrangements are included in this category, as they provide creditors with a degree of control over the company's financial and business decisions in downturns, which are not enjoyed under typical corporate funding arrangements. Specific structural features that we classify in this category include:

i. Step-in rights and remedies to delay licence termination or insolvency (e.g. direct agreements, security and intercreditor agreements, etc).

ii. Restrictions on payments and distribution lock-ups (e.g. if metrics deteriorate below minimum required parameters).

iii. Frequent and regular reports of creditors' technical advisers to sanction base case validity and compliance with contractual and financial obligations.

As for the previous category (Debt Structure and Liquidity Protection), the whole package of structural enhancements is assessed to gauge the overall effectiveness. For example, independent validation of compliance with financial ratio covenants may be an important consideration in assessing the effectiveness of such covenants.[22] Creditor step-in rights should be specifically permitted under the licence or legal framework as well as the finance documents.

We give value to security arrangements – typically in respect of the shares in a regulated network entity – as one albeit critical element of a wider package of concessions 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), or, if remedial action is not possible or fails, to maximise recovery prospects. As normally security is not allowed or is not enforceable on the regulated assets, a rating uplift is not generally achievable simply by granting security.

In conclusion, Moody's believes that structural enhancements can deliver up to three notches of uplift from a fundamental rating if they are very comprehensive and effective. Sources of creditor protection can be regarded as very restrictive by management and shareholders as they can significantly constrain management's ability to pursue strategies and policies that they may perceive will enhance shareholder value, even though they may potentially result in higher risks for the company. Consequently, in many cases, protective arrangements granted to creditors are not as fully comprehensive as those envisioned by Moody's to obtain the maximum possible uplift. Consequently, a maximum rating uplift or one or two rating notches may be considered a more likely result from this notching exercise.

[22] A test to assess the effectiveness of financial covenants in terms of definition and threshold levels that we often use is to run increasingly negative downside sensitivities and see (i) whether and when distribution lock-ups are activated, and (ii) whether trapped cash provides material support to the company's credit metrics at meaningful levels.

Rating Methodology Assumptions and Limitations, and other Rating Considerations

Moody's notes that this rating methodology generates modelled indicative ratings that are generally in the "Baa" category or higher. Indeed, under the current bands for Key Credit Metrics, a "typical" Western European or Australian regulated network with solid business risk fundamentals would demonstrate a final modelled rating no lower than Ba1 or Ba2 even with very high leverage. However, this does not mean that Moody's would not rate regulated networks at lower levels. Rather, this methodological bias reflects the very strong fundamental characteristics of the industry and the propensity for issuers to maintain ratings in the "Baa" or "A" categories. Such propensity is very often underpinned by the requirement for regulated networks to maintain an investment-grade rating as (i) the result of an informal agreement with the regulator or (ii) a formal condition under their licence, as is the case for UK electric and gas networks. With the exception of some emerging market issuers, all regulated networks rated by Moody's hold investment-grade ratings (see Figure 1 above).

Although the rating factors described in this methodology cover the principal drivers of our rating analysis, the analytical process also includes a number of important considerations that are consistently examined for fundamental issuers in general. Such factors include liquidity, notching practices for debt subordination, management quality and corporate governance, legal and environmental matters, financial reporting and overall disclosure, as well as the extent of likely government support. These matters are dealt with by Moody's in the form of overriding rating methodologies and practices that are applied in accordance with general credit policy guidelines. In situations where a network's rating is materially influenced by any such factor so as to diverge from the rating resulting from the application of Moody's industry methodology, we explain the relevant rating factors in company-specific research.

Conclusion: Summary of the Grid-Indicated Rating Outcomes

For the 25 representative networks highlighted (excluding Bord Gais Eireann and Federal Grid Company whose BCAs are expressed as a range), the methodology grid-indicated ratings map to current assigned ratings (or BCAs where relevant) as follows (see Appendix B for the details):

- 32% or 8 companies map to their assigned rating (or BCA where relevant)
- 52% or 13 companies have grid-indicated ratings that are within one alpha-numeric notches of their assigned ratings (or BCAs where relevant)
- 8% or 2 companies have grid-indicated ratings that are within two alpha-numeric notches of their assigned ratings (or BCAs where relevant)
- 8% or 2 companies have grid-indicated ratings that are more than two alpha-numeric notches of their assigned ratings (or BCAs where relevant)

Overall, the vast majority (92%) of the grid-indicated rating outcomes is within two alpha-numeric notches of their assigned ratings (or BCAs where relevant) and 84% of the grid-indicated ratings are within one alpha-numeric notch of their assigned ratings (or BCAs where relevant).

Regulated Electric and Gas Networks

Grid-Indicated Rating Outcomes

Map to Assigned Rating/BCA:	Map to Within One Notch:	Map to Within Two Notches:
Enagas S.A.	DBNGP Finance Co Pty Ltd	MOESK, OJSC
ETSA Utilities Finance Pty Limited	ElectraNet Pty Limited	United Energy Distribution Pty Ltd
Fingrid Oyj	Energy Partnership (Gas) Pty Ltd	
Red Electrica de Espana, S.A.U.	Envestra Ltd	
REN - Redes Energeticas Nacionais	Northern Gas Networks Limited	
Statnett SF	Powercor Australia LLC	
Terna - Rete Elettrica Nazionale SpA	Scotland Gas Networks plc	
Wales & West Utilities Limited	Slovensky Plynarensky Priemysel, a.s.	
	Southern Gas Networks plc	
	Spark Infrastructure	
	Transpower New Zealand Limited	
	Vector Ltd	
	WA Network Holdings	

Regulated Electric and Gas Networks

Appendix A: Regulated Networks Methodology Factor Grid

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

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) Stability and Predictability of Regulatory Regime	Regulation is independent, well established (>15 years of being predictable and stable) and transparent (published methodologies clearly define risk allocation between companies and customers and are consistently applied, with public or shared financial model)	Regulation is independent, reasonably well established (>10 years of being predictable and stable) and transparent (published methodologies clearly define risk allocation between companies and customers and are generally consistently applied)	Regulation is generally independent and developed (published methodologies set out principles of risk allocation between companies and customers and are based on established precedents in the same jurisdiction)	Regulatory framework is relatively new and untested, but methodologies are based on established precedents and jurisdiction has a history of independent and transparent regulation for other utility services	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	Regulatory framework is unclear, untested or undergoing significant change, with a history of political interference	15.00%
b) Asset Ownership Model	All key T&D assets held outright in perpetuity	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	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%)	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%)	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%)	Key T&D assets held under short-term operating leases or management contracts (limited portfolio diversification)	10.00%

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c) Cost and Investment Recovery (Ability & Timeliness)	No regulatory or contractual impediment to adjust tariffs (no approval or reviews required)	Tariff formula allows for timely recovery of operating expenditure including depreciation, electricity losses and balancing costs/shrinkage gas and a fair return on all investment Depreciation allowance fairly reflects asset consumption All capital expenditure is included in asset base as incurred	Tariff formula allows 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 Depreciation allowance fairly reflects asset consumption 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)	Tariff formula allows 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 back-loading (e.g. depreciation allowance set below asset consumption or operating expenditure is capitalised)	Tariff formula does not 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 allow coverage of most operating expenditure but investment is not clearly or fairly remunerated	Tariff formula does not 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 only partially cover cash operating expenditure	10.00%
d) Revenue Risk	No exposure to volume risk: collected revenues based on capacity charges	Little exposure to volume risk: collected revenues based on volume charges but revenue cap (existence of timely recovery mechanism)	Limited exposure to volume risk: revenue cap with collected revenues based on volatile volumes OR hybrid/price cap with low volatility in volumes	Moderate exposure to volume risk: hybrid/price cap with moderate volatility in volumes OR Some reliance on connection revenues	Material exposure to volume risk: price cap with significant volatility in volumes OR Material reliance on connection revenues	High exposure to volume risk: price cap with substantial volatility in volumes OR Very high reliance on connection revenues	5.00%

Factor 2: Efficiency and Execution Risk (10%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) Cost Efficiency	Track record of very high performance vs. regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Track record of high performance vs. regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Track record of outperforming regulator's assumptions / above benchmarks across regulatory periods on key measures (e.g. WACC, opex, capex)	Performance in line with benchmarks / regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Below benchmarks / regulator's assumptions across regulatory periods on key measures (e.g. WACC, opex, capex)	Poor track record across regulatory periods on key measures (e.g. WACC, opex, capex)	6.00%

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b) Scale and Complexity of Capital Programme	Annual total capital expenditure (maintenance & enhancement) ≤ 4% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 4% ≤ 6% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 6% ≤ 8% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 8% ≤ 12% of total fixed assets or regulated asset base	Annual total capital expenditure (maintenance & enhancement) > 12% ≤ 20% of total fixed assets or regulated asset base OR Small number of large and complex projects accounts for majority of capital programme	Annual total capital expenditure (maintenance & enhancement) > 20% of total fixed assets or regulated asset base OR One large and complex project accounts for majority of capital programme	4.00%

Factor 3: Stability Of Business Model And Financial Structure (10%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) Ability and Willingness to Pursue Opportunistic Corporate Activity (M&A, Disposals & Investments)	Covenants prohibit all corporate activity OR Corporate activity is outside of management mandate	Covenants or licence/concession largely limit corporate activity, with exception of certain defined permitted investments	Strong track record of no material corporate activity and stated intention to refrain from M&A and major investments OR Regulatory restrictions but residual exposure to affiliates	Moderate, may impact credit metrics for 18-24 months only	Track record of repetitive, sizeable transactions	Highly likely to conduct frequent and very large opportunistic investments	3.33%
b) Ability and Willingness to Increase Leverage	No additional indebtedness allowed without debt holders' consent	Additional indebtedess only allowed for capex under debt covenants and/or licence/concession terms	Financial covenants in principal debt instruments limit management ability to materially increase leverage	Conservative financial strategy, untikely to compromise minimum financial parameters	Limited track record of consistent financial policies; likely to target high leverage	Track record of aggressive financial policies and very high leverage; likely to pay out creditors' financial cushion ahead of business pressures	3.33%
c) Targeted Proportion of Operating Profit Outside Core Regulated Activities	0% (Exclusive focus on core T&D activities) OR Covenants prohibit all other businesses	0-5% OR Covenants largely limit unregulated businesses, with exception of certain defined and low risk permitted businesses	5-10%	10-15%	15-20%	>20%	3.33%

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Factor 4: Key Credit Metrics (40%)

Rating Sub-Factor	Aaa	Aa	A	Baa	Ba	B	Sub-weighting
a) 3-yr Adjusted Interest Cover Ratio	≥6.0x	≥4.0x - 6.0x	≥2.0x - 4.0x	≥1.4 - 2.0x	≥1.1 - 1.4x	<1.1x	
OR	OR	OR	OR	OR	OR	OR	15.00%
3-yr FFO Interest Cover	≥7.0x	≥5.0 - 7.0x	≥3.5 - 5.0x	≥2.5 - 3.5x	≥1.5 - 2.5x	<1.5x	
b) 3-yr Net Debt/Regulatory Asset Value (or Fixed Assets)	≤30%	>30 - 45%	>45 - 60%	>60 - 75%	>75 - 90%	>90%	15.00%
c) 3-yr FFO/Net Debt	≥30%	≥20 - 30%	≥12 - 20%	≥8 - 12%	≥4 - 8%	<4%	5.00%
d) 3-yr RCF/Capex	≥3.5x	≥2.5 - 3.5x	≥1.5 - 2.5x	≥1.0 - 1.5x	≥0.5 - 1.0x	<0.5x	5.00%

Appendix B: Ratings Mapping

An issuer may be placed higher or lower on a specific sub-factor than its final modelled rating. This reflects the relative strengths and weaknesses of an individual issuer on each of the sub-factors considered rating significant, and is not of itself a concern. In particular, given the propensity for private sector infrastructure companies to use debt leverage to improve shareholder returns, it would not be unexpected for an issuer to score high on fundamental assessment sub-factors and low on the Key Credit Metric sub-factors to achieve a targeted rating somewhere in between, i.e. to use the debt capacity created by a fundamentally sound businesses with long-term visibility of cash flows. A large number of issuers are positive outliers under Key Rating Factors #1 and #2, but rank as negative outliers under Key Rating Factor #4.

Overall, however, the methodology indicates ratings for most issuers that are either at the level of their actual ratings (or BCA if applicable) or within one notch, with the exception of emerging market issuers, including MOESK, Federal Grid Company, KEGOC and Transelectrica, for which the differential is two to three notches due to their very strong historical financial profiles. The full results of this mapping and indicated ratings are summarised below. Additional factors that constrain credit quality in the countries where these companies operate (e.g. liquidity or currency risks) and that are not industry-specific are also taken into account to assign ratings to these issuers.

Sub-Factor Weights				15.00%	10.00%	10.00%	5.00%	6.00%	4.00%	3.33%	3.33%	3.33%	15.00%	15.00%	5.00%	5.00%
Company	Rating	Outlook	Indicated Rating	Stability and Predictability of Regulatory Regime	Asset Ownership Model	Cost and Investment Recovery	Revenue Risk	Cost Efficiency	Scale and Complexity of Capital Programme	Ability and Willingness to Pursue Opportunistic Corporate Activity	Ability and Willingness to Increase Leverage	Targeted Proportion of Operating Profit Outside Core Regulated Activities	Adjusted ICR (or FFO Interest Cover)	Net Debt/RAV (or Fixed Assets)	FFO/Net Debt	RCF/Capex
Fingrid	Aa3 [5]	Stable	A1	Aa	Aa	Aa	Aa	Aa	Baa	A	Baa	Aa	A	Baa	A	Baa
Transpower NZ	Aa3 [6]	Stable	A3	Baa	Aa	Baa	Aa	Aaa	Baa	A	Baa	A	A	A	Aa	Ba
Statnett	Aa3 [7]	RUR Down	A3	Aa	Aa	A	Aa	A	Ba	A	Baa	Aa	A	Baa	A	B
SPP	A1 [7]	Stable	Baa1	Ba	Aaa	Ba	Ba	Aa	Aaa	A	Baa	Aaa	Aaa	Aaa	Aaa	B
Enagas	A2	Stable	A2	A	Aaa	A	Aa	Baa	Baa	Baa	Baa	Aa	Aa	Aa	A	Ba
Red Electrica	A2 [6]	Stable	A2	A	Aaa	A	Aaa	Baa	Ba	Baa	Baa	Aa	Aa	A	A	Ba
Terna	A2 [7]	Stable	A3	Aa	Aa	A	Aa	Baa	Baa	Baa	Baa	A	A	A	A	B
REN	A2 [8]	Stable	Baa1	A	Aa	A	Aa	Baa	Ba	A	Baa	Aa	A	Baa	Baa	B
Bord Gais Eireann	A2 [8-10]	Stable	A3	Aa	Aa	A	Aaa	Baa	Ba	Baa	Baa	B	A	Aa	A	Ba
ETSA Utilities	A3	Stable	A3	Aaa	Aa	A	A	Aaa	Baa	A	Baa	A	Baa	Ba	A	Ba
Powercor Australia	A3	Stable	Baa1	Aaa	Aa	A	A	Aaa	Baa	A	Baa	A	A	Ba	Aa	B
Electranet	Baa1	Stable	Baa2	Aaa	Aa	A	Aa	Aaa	Baa	A	Baa	A	Ba	Ba	Baa	B
Northern Gas	Baa1	Stable	A3	Aaa	Aa	A	Aaa	Baa	Baa	A	Baa	Aa	Baa	Baa	A	Ba
Scotland Gas	Baa1	Stable	A3	Aaa	Aa	A	Aaa	Baa	Ba	A	Baa	Aa	Baa	Baa	Baa	Ba
Southern Gas	Baa1	Stable	A3	Aaa	Aa	A	Aaa	Baa	Baa	A	Baa	Aa	Baa	Baa	Baa	Ba
United Energy Distribution	Baa1	Stable	Baa3	Aaa	Aa	A	A	Aaa	Baa	A	Baa	A	Ba	B	Baa	Ba
Vector	Baa1	Stable	Baa2	Baa	Aa	Baa	A	A2	A	Baa	Baa	A	Baa	Ba	Baa	Ba

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Sub-Factor Weights				15.00%	10.00%	10.00%	5.00%	6.00%	4.00%	3.33%	3.33%	3.33%	15.00%	15.00%	5.00%	5.00%
Company	Rating	Outlook	Indicated Rating	Stability and Predictability of Regulatory Regime	Asset Ownership Model	Cost and Investment Recovery	Revenue Risk	Cost Efficiency	Scale and Complexity of Capital Programme	Ability and Willingness to Pursue Opportunistic Corporate Activity	Ability and Willingness to Increase Leverage	Targeted Proportion of Operating Profit Outside Core Regulated Activities	Adjusted ICR (or FFO Interest Cover)	Net Debt/RAV (or Fixed Assets)	FFO/Net Debt	RCF/Capex
Wales & West	Baa1	Stable	Baa1	Aaa	Aa	A	Aaa	Baa	Baa	Aa	A	Aa	Ba	Baa	Baa	B
Spark Infrastructure	Baa1	Negative	Baa2	Aaa	Aa	A	A	Aaa	Baa	A	Baa	A	Baa	B	A	Ba
WA Network	Baa2	Stable	Baa3	Aaa	Aa	A	A	Aaa	A	A	A	A	Ba	B	Ba	Ba
Federal Grid Company	Baa2 [11-13]	Stable	Baa3	B	Aaa	Ba	Baa	Baa	B	Baa	Ba	A	Aaa	Aaa	Aaa	B
DBNGP	Baa2	Negative	Baa1	Aaa	Aa	A	A	Aaa	Ba	A	A	A	Ba	Baa	Ba	B
Energy Partnership (Gas)	Baa2	Negative	Baa3	Aaa	Aa	A	A	Aaa	Aa	A	Baa	A	Ba	B	Ba	Ba
Envestra	Baa2	Negative	Baa3	Aaa	Aa	A	A	Aaa	Aa	A	Baa	A	Ba	B	Ba	B
Transelectrica	Baa3 [13]	Stable	Baa3	B	Aaa	Ba	Ba	Ba	Ba	A	Ba	B	Aaa	Aa	Aaa	Ba
KEGOC	Baa3 [14]	Negative	Ba1	B	Aaa	Ba	B	Baa	B	A	B	Baa	A	Aaa	Aaa	B
MOESK	Ba2	Stable	Baa3	B	Aaa	Ba	Ba	Ba	B	Baa	Ba	Baa	Aaa	Aaa	Aaa	Ba

Positive Outlier

Negative Outlier

Appendix C: Observations and Outliers for Grid Mapping

Factor 1: Ratings Mapping

The following table details the mapping for Regulatory Environment and Asset Ownership Model:

Factor 1: Regulatory Environment and Asset Ownership Model

Sub-Factor Weights				15.0%	10.0%	10.0%	5.0%
Company	Rating	Outlook	Indicated Rating	Stability and Predictability of Regulatory Regime	Asset Ownership Model	Cost and Investment Recovery	Revenue Risk
Fingrid	Aa3 [5]	Stable	A1	Aa	Aa	Aa	Aa
Transpower NZ	Aa3 [6]	Stable	A3	Baa	Aa	Baa	Aa
Statnett	Aa3 [7]	RUR Down	A3	Aa	Aa	A	Aa
SPP	A1 [7]	Stable	Baa1	Ba	Aaa	Ba	Ba
Enagas	A2	Stable	A2	A	Aaa	A	Aa
Red Electrica	A2 [6]	Stable	A2	A	Aaa	A	Aaa
Terna	A2 [7]	Stable	A3	Aa	Aa	A	Aa
REN	A2 [8]	Stable	Baa1	A	Aa	A	Aa
Bord Gais Eireann	A2 [8-10]	Stable	A3	Aa	Aa	A	Aaa
ETSA Utilities	A3	Stable	A3	Aaa	Aa	A	A
Powercor Australia	A3	Stable	Baa1	Aaa	Aa	A	A
Electranet	Baa1	Stable	Baa2	Aaa	Aa	A	Aa
Northern Gas	Baa1	Stable	A3	Aaa	Aa	A	Aaa
Scotland Gas	Baa1	Stable	A3	Aaa	Aa	A	Aaa
Southern Gas	Baa1	Stable	A3	Aaa	Aa	A	Aaa
United Energy Distribution	Baa1	Stable	Baa3	Aaa	Aa	A	A
Vector	Baa1	Stable	Baa2	Baa	Aa	Baa	A
Wales & West	Baa1	Stable	Baa1	Aaa	Aa	A	Aaa
Spark Infrastructure	Baa1	Negative	Baa2	Aaa	Aa	A	A
WA Network	Baa2	Stable	Baa3	Aaa	Aa	A	A
Federal Grid Company	Baa2 [11-13]	Stable	Baa3	B	Aaa	Ba	Baa
DBNGP	Baa2	Negative	Baa1	Aaa	Aa	A	A
Energy Partnership (Gas)	Baa2	Negative	Baa3	Aaa	Aa	A	A
Envestra	Baa2	Negative	Baa3	Aaa	Aa	A	A
Transelectrica	Baa3 [13]	Stable	Baa3	B	Aaa	Ba	Ba
KEGOC	Baa3 [14]	Negative	Ba1	B	Aaa	Ba	B
MOESK	Ba2	Stable	Baa3	B	Aaa	Ba	Ba

Positive Outlier

Negative Outlier

Observations and Outliers:

Given the fundamentally low business risk profile of the industry, it is not surprising that most issuers score more strongly on this factor than their final rating (or BCA if applicable) and hence rank as positive outliers. This reflects the generally very stable and predictable nature of the regulatory frameworks under which such issuers operate.

Of the 27 issuers highlighted, there is only one negative outlier, Slovensky Plynarensky Priemysel (SPP). As the owner of Slovakia's gas transmission and distribution pipelines, SSP operates under a regulatory framework with limited transparency and track-record, and subject to increased political influence. This is however mitigated by a very strong financial profile.

Regulated Electric and Gas Networks

Factor 2: Ratings Mapping

The following table details the mapping for Efficiency and Execution Risk:

Factor 2: Efficiency and Execution Risk

Sub-Factor Weights				6.0%	4.0%
Company	Rating	Outlook	Indicated Rating	Cost Efficiency	Scale and Complexity of Capital Programme
Fingrid	Aa3 [5]	Stable	A1	Aa	Baa
Transpower NZ	Aa3 [6]	Stable	A3	Aaa	Baa
Statnett	Aa3 [7]	RUR Down	A3	A	Ba
SPP	A1 [7]	Stable	Baa1	Aa	Aaa
Enagas	A2	Stable	A2	Baa	Baa
Red Electrica	A2 [6]	Stable	A2	Baa	Ba
Terna	A2 [7]	Stable	A3	Baa	Baa
REN	A2 [8]	Stable	Baa1	Baa	Ba
Bord Gais Eireann	A2 [8-10]	Stable	A3	Baa	Ba
ETSA Utilities	A3	Stable	A3	Aa3	Baa
Powercor Australia	A3	Stable	Baa1	Aaa	Baa
Electranet	Baa1	Stable	Baa2	Aa1	Baa
Northern Gas	Baa1	Stable	A3	Baa	Baa
Scotland Gas	Baa1	Stable	A3	Baa	Ba
Southern Gas	Baa1	Stable	A3	Baa	Baa
United Energy Distribution	Baa1	Stable	Baa3	Aa3	Baa
Vector	Baa1	Stable	Baa2	Aa3	A
Wales & West	Baa1	Stable	Baa1	Baa	Baa
Spark Infrastructure	Baa1	Negative	Baa2	Aa1	Baa
WA Network	Baa2	Stable	Baa3	Aaa	Aa
Federal Grid Company	Baa2 [11-13]	Stable	Baa3	Baa	B
DBNGP	Baa2	Negative	Baa1	Aaa	Ba
Energy Partnership (Gas)	Baa2	Negative	Baa3	Aaa	Aa
Envestra	Baa2	Negative	Baa3	Aaa	Aa
Transelectrica	Baa3 [13]	Stable	Baa3	Ba	Ba
KEGOC	Baa3 [14]	Negative	Ba1	Baa	B
MOESK	Ba2	Stable	Baa3	Ba	B

Positive Outlier

Negative Outlier

Observations and Outliers:

There are several positive outliers under the Cost Efficiency sub-factor. These are predominantly networks located in Australia or New Zealand, that have historically been able to significantly outperform regulatory assumptions on the cost of capital due to the availability of relatively cheap long-term debt.

There are a few outliers under the sub-factor relative to the Scale and Complexity of Capital Programme. Positive outliers include gas networks in Australia (WA Network, Energy Partnership (Gas) and Envestra) that

have moderate capital programmes. Negative outliers include Red Electrica and Statnett, which face large capex plans to reinforce and expand their high-voltage grids so as to meet the growing power needs of their respective countries.

Factor 3: Ratings Mapping

The following table details the mapping for Stability of Business Model and Financial Structure:

Factor 3: Stability of Business Model and Financial Structure

Sub-Factor Weights				3.3%	3.3%	3.3%
Company	Rating	Outlook	Indicated Rating	Ability and Willingness to Pursue Opportunistic Corporate Activity	Ability and Willingness to Increase Leverage	Targeted Proportion of Operating Profit Outside Core Regulated Activities
Fingrid	Aa3 [5]	Stable	A1	A	Baa	Aa
Transpower NZ	Aa3 [6]	Stable	A3	A	Baa	A
Statnett	Aa3 [7]	RUR Down	A3	A	Baa	Aa
SPP	A1 [7]	Stable	Baa1	A	Baa	Aa
Enagas	A2	Stable	A2	Baa	Baa	Aa
Red Electrica	A2 [6]	Stable	A2	Baa	Baa	Aa
Terna	A2 [7]	Stable	A3	Baa	Baa	A
REN	A2 [8]	Stable	Baa1	A	Baa	Aa
Bord Gais Eireann	A2 [8-10]	Stable	A3	Baa	Baa	B
ETSA Utilities	A3	Stable	A3	A	Baa	A
Powercor Australia	A3	Stable	Baa1	A	Baa	A
Electranet	Baa1	Stable	Baa2	A	Baa	A
Northern Gas	Baa1	Stable	A3	A	Baa	Aa
Scotland Gas	Baa1	Stable	A3	A	Baa	Aa
Southern Gas	Baa1	Stable	A3	A	Baa	Aa
United Energy Distribution	Baa1	Stable	Baa3	A	Baa	A
Vector	Baa1	Stable	Baa2	Baa	Baa	A
Wales & West	Baa1	Stable	Baa1	Aa	A	Aa
Spark Infrastructure	Baa1	Negative	Baa2	A	Baa	A
WA Network	Baa2	Stable	Baa3	A	A	A
Federal Grid Company	Baa2 [11-13]	Stable	Baa3	Baa	Ba	A
DBNGP	Baa2	Negative	Baa1	A	A	A
Energy Partnership (Gas)	Baa2	Negative	Baa3	A	Baa	A
Envestra	Baa2	Negative	Baa3	A	Baa	A
Transelectrica	Baa3 [13]	Stable	Baa3	A	Ba	B
KEGOC	Baa3 [14]	Negative	Ba1	A	B	Baa
MOESK	Ba2	Stable	Baa3	Baa	Ba	Baa

Positive Outlier

Negative Outlier

Observations and Outliers:

There are several positive outliers under this factor, mostly reflecting the focus of shareholders and managements on the core regulated business. In particular, Wales & West Utilities scores more strongly on two sub-factors than its final rating owing to the degree of risk mitigation offered by the covenant and security package embedded within its financial documents.

Regulated Electric and Gas Networks

There is one negative outlier under this factor, Bord Gais Eireann. The "B" score under the third sub-factor reflects Moody's expectation that the share of unregulated activities will grow significantly as the company invests in generation capacity.