

CREDIT OPINION

11 June 2024

Update

Send Your Feedback

RATINGS

Norsk Hydro ASA

Domicile	Oslo, Norway
Long Term Rating	Baa2
Type	LT Issuer Rating - Dom Curr
Outlook	Stable

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

Contacts

Tobias Wagner, CFA +44.20.7772.5308
VP-Sr Credit Officer
tobias.wagner@moodys.com

Richard Etheridge +44.20.7772.1035
Associate Managing Director
richard.etheridge@moodys.com

Norsk Hydro ASA

Update following upgrade

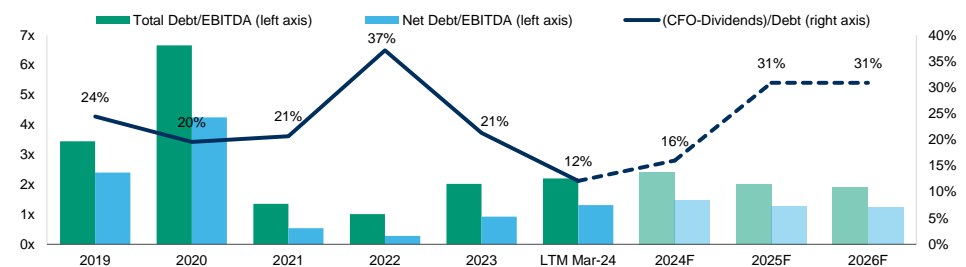
Summary

[Norsk Hydro ASA's](#) Baa2 rating reflects the benefits of its integrated business profile including cost-competitive upstream operations with integration into raw materials and energy, and its downstream market leadership position in its Extrusions segment. It also continues to reflect the company's financial framework and strong liquidity profile. However, the aluminium sector also remains volatile and capital-intensive with additional exposure for the company to exchange rates mostly US dollar and Brazilian real relative to the Norwegian krone.

The company's 2023 profitability, leverage and cash flow generation was pressured by both cost and weak prices and demand in core end markets, a trend that we expect to continue in 2024. Despite these challenges Norsk Hydro's Moody's-adjusted debt/EBITDA remained solid and, if recently rising prices are sustained, we expect it to start improving in 2024. However, Norsk Hydro is also continuing to invest at record levels while distributing significant cash flow to shareholders as it looks towards its company-adjusted net debt target of around NOK25 billion over the cycle.

Exhibit 1

Leverage and cash flow generation metrics likely to remain strong despite weak market



All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

Periods are financial year-end unless indicated. LTM = Last 12 months.

Moody's forecasts are Moody's opinion and do not represent the views of the issuer.

Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

Credit Strengths

- » Competitive and integrated upstream business benefiting from favourable position on industry's cost curves and stable access to low cost energy sources
- » Leading market position in Extrusions segment
- » Resilient cash flow generation despite exposure to volatile aluminium market
- » Conservative financial framework, solid metrics and robust liquidity profile
- » Hedging programme and integrated nature mitigate some of the sector volatility

Credit Challenges

- » Exposure to a single metal, aluminium, and a capital and energy intensive sector
- » High sensitivity of EBITDA to volatile aluminium prices and exchange rates such as NOK-USD and USD-BRL
- » Persistent challenging operating environment in the global aluminium markets
- » High levels of growth investments and shareholder returns from cash flow

Rating Outlook

The stable outlook reflects our expectation that credit metrics are likely to remain within the expectations for the Baa2, specifically leverage below 2.5x, through a reasonable range of market conditions.

Factors that Could Lead to an Upgrade

An upgrade would require maintaining an EBIT margin sustained around at least 10% and debt to EBITDA below 1.0x, with CFO minus dividends to debt above 40% and consistent positive FCF generation.

Factors that Could Lead to a Downgrade

Negative pressure would result from a prolonged deterioration in operating profitability and cash flow generation resulting in negative FCF, weakening liquidity and deterioration in leverage metrics. More specifically, CFO minus dividends to debt below 30% or debt to EBITDA rising above 2.5x would result in negative pressure. Any weakening of the company's conservative financial policy would also likely pressure the ratings.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody's.com> for the most updated credit rating action information and rating history.

Key indicators

Exhibit 2

Norsk Hydro ASA

(in \$ billions)	2019	2020	2021	2022	2023	LTM Mar-24	2024F	2025F	2026F
Revenue	17.0	12.2	17.4	21.7	18.4	18.1	19.2	19.7	20.4
Business Profile	Baa	Baa	Baa	Baa	Baa	Baa	Baa	Baa	Baa
EBIT Margin %	2.1%	6.4%	13.6%	15.2%	6.7%	6.4%	5.2%	7.2%	7.6%
EBIT / Interest Expense	3.2x	0.1x	14.5x	19.8x	5.1x	4.6x	4.0x	6.2x	7.0x
Debt / EBITDA	3.4x	6.7x	1.4x	1.0x	2.0x	2.2x	2.4x	2.0x	1.9x
Debt / Total Capital	31.4%	37.7%	29.2%	26.7%	28.8%	29.3%	30.8%	29.9%	29.1%
(CFO - Dividends) / Debt	24.4%	19.6%	20.7%	37.1%	21.3%	12.1%	16.0%	30.9%	30.9%
Financial Policy	Baa	Baa	Baa	Baa	Baa	Baa	Baa	Baa	Baa
EBITDA Margin %	7.9%	6.4%	18.8%	19.5%	11.6%	11.4%	10.4%	12.5%	13.0%
EBITA / Interest Expense	3.0x	0.4x	14.8x	20.0x	5.3x	4.8x	4.2x	6.3x	7.2x
FCF/ Debt	0.2%	6.7%	2.6%	10.5%	-12.2%	-20.2%	-20.3%	-3.3%	-3.4%

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

Periods are financial year-end unless indicated. LTM = Last 12 months.

Moody's forecasts are Moody's opinion and do not represent the views of the issuer.

Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

Detailed Credit Considerations

Integrated business profile positive, but also constrained by exclusive focus on volatile aluminium market

Hydro's operations are fully integrated and span most of the aluminium value chain. Hydro's primary aluminium smelter portfolio holds a 20th percentile cost position in the sector benefiting from its cost-efficient primary aluminium facilities and structural cost improvements in recent years.

Hydro's cost position is further underpinned by the 12th percentile cost position of its large integrated Alunorte refinery and Paragominas bauxite mine. Additional 30% of Alunorte's bauxite requirements are sourced under long term off-take agreements from [Glencore's](#) (Baa1 positive) 45% interest in the MRN bauxite mine, while alumina is also purchased from a number of external sources including a long-term supply contract with [Rio Tinto](#) (A1 stable) for 900,000 mt of alumina p.a. until 2030 from the Yarwin refinery. At the same time substantial bauxite and alumina volumes are sold externally. When operating at full production capacity, Hydro used to have a long position in both bauxite and alumina, but after its 30% stake sale in Alunorte and 5% stake sale in MRN to Glencore in 2023, this has become more marginal.

Backwards integration into energy production benefits upstream activities, because energy cost accounts for 25%, 35% and 35% of bauxite, alumina and primary aluminium operating cash cost over the cycle. Norsk Hydro's power needs for its Norwegian primary aluminium smelters are around 50% covered by its own hydropower assets while the other half is secured under wind- and hydropower contracts until around 2030. For its joint venture smelters the situation varies, but Qatalum benefits from its own captive power while most others are also under secured contracts until at least 2027. However, Norsk Hydro has also not been immune to the difficult conditions in Europe and shut down its Slovalco smelter because of energy cost pressures and also reduced some production in Norway to adjust to weakening demand. Its Bauxite & Alumina business is also, until 2025, transitioning from fuel oil and coal towards gas and electrical boilers supported by Hydro Rein, which will improve cost and its emissions profile. The benefits of its integrated model also result in increased profit from energy sales during lower aluminium production periods and can balance cost pressures or lower aluminium price environments as was the case in the fourth quarter of 2022.

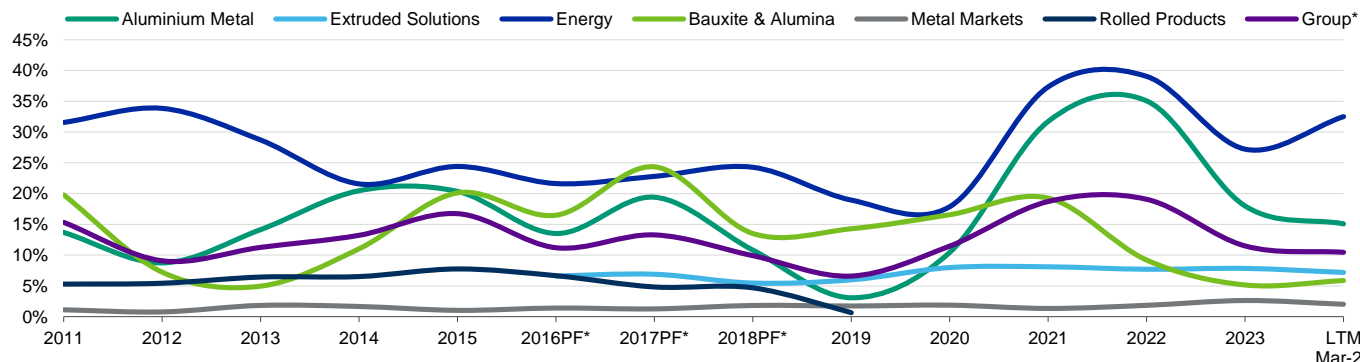
Downstream, Norsk Hydro is the world's largest extruded solutions provider, enjoying market leadership in North America and Europe. Peers include [Arsenal AIC Parent LLC](#) (B1 stable), [Novelis Inc.](#) (Ba2 stable) and [Constellium SE](#) (Ba3 stable).

However, Hydro's business profile remains constrained by its exposure to the highly cyclical, capital and energy-intensive commodity sector with a focus on a single metal, aluminium. Despite its integrated business model, Hydro historically derived most its earnings from its upstream bauxite & alumina and primary aluminium metal businesses although contributions from other businesses such as Extrusions are increasing, as Exhibit 3 shows.

Exhibit 3

Most segments contribute meaningfully to profit

Company EBITDA margin by business segment



*Based on pro-forma information for 2016-2018.

2020-LTM ratios are based on company-adjusted EBITDA.

LTM = Last 12 months.

Source: Company data

Aluminium market uncertainty high with weak prices and demand

The main end markets for the downstream business are transportation and construction sectors, which account for around half global aluminium demand. There is also increasing demand for lower emission products including through increasing use of recycled material or lower emission production. Norsk Hydro seeks to grow downstream and especially in these products that potentially demand greater premiums over time and may reduce volatility from the volatile upstream element of the sector.

Aluminium prices reached historic highs in the first half of 2022 on the back of supply chain challenges and recovery in demand. The prices sharply declined since on lower demand while cost inflation, especially energy, and other market dislocations also provided for a difficult market environment. In the second quarter of 2024, prices started rising again to slightly above the higher end of our medium term price range of around 0.9-1.1 \$/lb partly because of the exclusion of Russian metals from LME-registered warehouses, but the demand remains weak currently. At lower price levels higher cost producers may consider curtailments, and have done so, and hence support the pricing environment in our view. Nevertheless, supply and demand balances also depend on a number of factors outside the company's control including China and Russia, both important participants in the market.

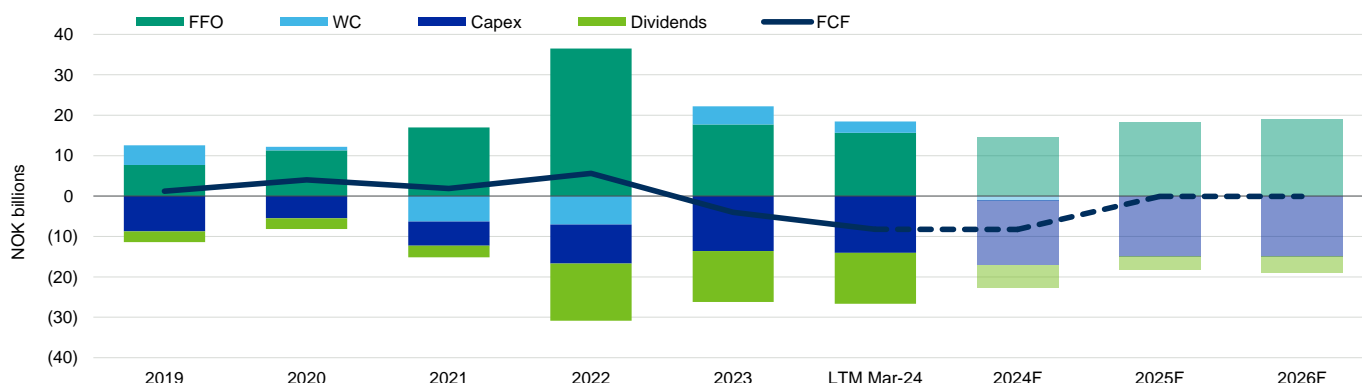
Strong financial profile helps weather uncertainties with metrics likely to remain strong in different price scenarios, also supported by structural cost improvements

Norsk Hydro metrics weakened significantly in the 2018 to 2020 period through a combination of factors including the temporary production curtailment at the Alunorte alumina refinery, a cyberattack and ultimately the effects of the pandemic on the sector. However, the sector recovered and with it Norsk Hydro's metrics in 2022. In 2023 and LTM March 2024, the company's metrics somewhat deteriorated due to lower aluminium prices down from the peak in 2022 on low demand and persistent industry-wide cost inflation. Nevertheless, Norsk Hydro mitigates some of the sector's volatility through a comprehensive hedging programme that has, together with the company's integrated nature, contributed to reduce volatility. Cash flow generation has also been less volatile partly driven by some countercyclical working capital cash flow, as Exhibit 4 shows.

Exhibit 4

Cash flow has been less volatile than profit

Historical and projected cash flow



Periods are financial year-end unless indicated. LTM = Last 12 months.
 Moody's forecasts are Moody's opinion and do not represent the views of the issuer.
 Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

The company also embarked on a substantial ongoing multiyear improvement programme, for example structurally improving its profitability in the Extrusions segment. It also divested its lower profitability Rolled Products segment, which also substantially reduced pension liabilities. More recently, the company sold a stake in Alunorte alumina refinery for NOK8.4 billion in 2023 and also announced to raise \$332 million of capital for Hydro Rein renewables to form a joint venture that will fund related capex.

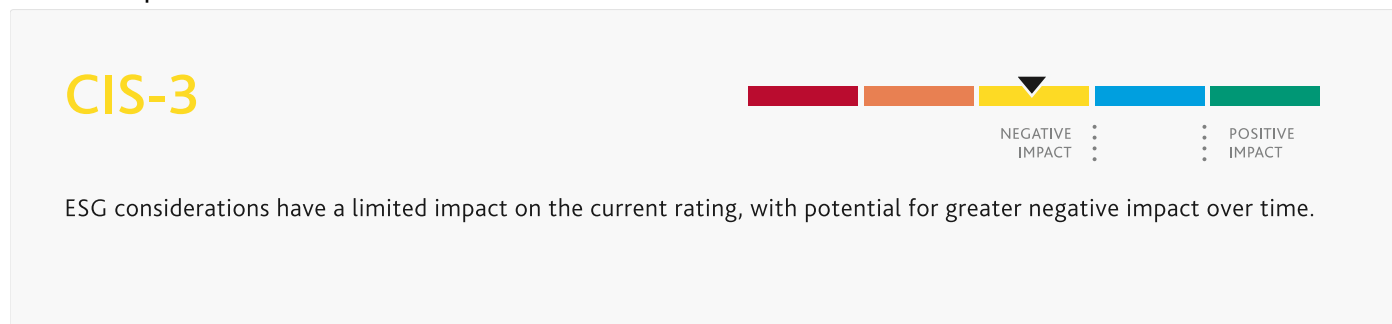
For 2024 if recent price increases persist, we expect some recovery in metrics although demand remains weak and shareholder remuneration and capital spending elevate. Norsk Hydro has an earnings-based dividend policy at minimum 50% of adjusted net income over the cycle with a floor of NOK1.25 per share (ca. NOK2.6 billion). While the company had paid out well in excess of that since 2021 including share buybacks, ordinary dividends payment was reduced by more than half for 2023. The company is accelerating investments and has a capex guidance of NOK15-17 billion for 2024, down from 21.1 billion in 2023 but well above historical levels and well above NOK11.8 billion in 2022, driven by increase in growth and return-seeking investments as well as FX effects and inflation. Nevertheless, there is some flexibility given that capex related to sustaining the business has been historically 60-70% of gross spending and the company plans to reduce it to 55% in medium- to long-term. The company also engages in a range of energy ventures adjacent to its core business, with the investment needed for Hydro Rein now offset by the stake sale. Nevertheless, we consider Norsk Hydro's financial policy as conservative taking into account its commitment to "maintaining investment-grade credit rating" and an adjusted net debt to adjusted EBITDA of below 2.0x over the cycle, although the latter leaves some flexibility for weaker metrics (1.1x as of Q1 2024).

ESG considerations

Norsk Hydro ASA's ESG credit impact score is CIS-3

Exhibit 5

ESG credit impact score



Source: Moody's Ratings

Norsk Hydro's **CIS-3** indicates that ESG considerations have a limited impact on the current credit rating with potential for greater negative impact over time. The score reflects significant environmental and social risks in line with the sector. This is mitigated by strong corporate governance and risk management policies, low financial leverage and a well-defined dividend policy.

Exhibit 6

ESG issuer profile scores



Source: Moody's Ratings

Environmental

The **E-5** score reflects exposure to a range of sector-wide natural capital, waste and pollution, water management and physical climate risk exposures given the significant impact on land and water usage of its mining and smelting operations. The company operates a bauxite mine and alumina refinery, with associated residue and tailings storage facilities, and primary aluminium smelters. More positively, we note the substantial use of hydroelectric energy in the production, leading to emissions that are much lower than those of its peers, and the strategic objective to reduce greenhouse gas emissions, waste and protect biodiversity in the areas in which Norsk Hydro operates. For example, Norsk Hydro is in the process of switching its energy consumption to gas and electricity for its large Alunorte alumina refinery, which will significantly reduce emissions, and is building out its recycling and renewables capacity to offer premium low carbon aluminum.

Social

The **S-4** score reflects high exposure to Health & Safety and Responsible Production. We also highlight the presence of a highly unionized workforce, although this has not impacted production and performance in recent years. Its injury frequency rate is far below the industry average. Norsk Hydro also runs several initiatives to promote the wellbeing and the developments of the communities in which it operates.

Governance

The **G-2** score reflects Norsk Hydro's prudent financial policy, for example characterized by low leverage and a comprehensive hedging program, and its substantial track record. The board composition is fully independent and it is aligned with best practices for the industry. Compliance and reporting are considered among best in class in the industry, as confirmed for instance by the handling of the cyberattack in 2019 and comprehensive quarterly disclosures.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moody's.com. In order to view the latest scores, please click [here](#) to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

Liquidity Analysis

Hydro's liquidity position is strong. As at March 2024, Hydro had cash balances of NOK19.6 billion and NOK5.0 billion of short-term investments. Its \$1.6 billion revolving multicurrency credit facility maturing in December 2026 was fully undrawn. In addition, the company renewed its additional \$1.0 billion undrawn revolving credit facility in February 2024 for two years with a one year extension option.

The company also had NOK8.2 billion of short-term bank loans maturing within 12 months, including some bonds.

Rating methodology and scorecard factors

The principal methodology used in these ratings was Mining. We also use the Government Related Issuers methodology. The scorecard-indicated outcome is below the actual rating as a result of current weak price and demand environment.

Hydro's Baa2 rating combines: (i) the company's standalone credit quality, or Baseline Credit Assessment ("bca") of baa2 and; (ii) Moody's assessment of the low co-dependency and low support of the Norwegian government.

Exhibit 7

Rating factors

Norsk Hydro ASA

Mining Industry Scorecard			Current LTM Mar-24		Moody's 12-18 month forward view	
Factor 1 : Scale (20%)	Measure	Score	Measure	Score	Measure	Score
a) Revenue (\$ billions)	18.1	Baa	19.7 - 20.2	Baa		
Factor 2 : Business Profile (25%)						
a) Business Profile	Baa	Baa	Baa	Baa		
Factor 3 : Profitability and Efficiency (10%)						
a) EBIT Margin (EBIT / Revenue)	6.4%	B	7.0% - 10.0%	B		
Factor 4 : Leverage and Coverage (30%)						
a) EBIT / Interest Expense	4.6x	Baa	6.0x - 10.0x	A		
b) Debt / EBITDA	2.2x	Baa	1.4x - 2.0x	Baa		
c) Debt / Total Capital	29.3%	Aa	27% - 30%	Aa		
d) (CFO - Dividends) / Debt	12.1%	B	30% - 40%	Baa		
Factor 5 : Financial Policy (15%)						
a) Financial Policy	Baa	Baa	Baa	Baa		
Rating:						
a) Scorecard-Indicated Outcome		Baa3		Baa2		
b) Actual Rating Assigned				Baa2		
Government-Related Issuer			Factor			
a) Baseline Credit Assessment		baa2				
b) Government Local Currency Rating		Aaa				
c) Default Dependence		Low				
d) Support		Low				
e) Actual Rating Assigned		Baa2				

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

LTM = Last 12 months.

Moody's forecasts are Moody's opinion and do not represent the views of the issuer.

Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

Appendix

Exhibit 8

Peer comparison
Norsk Hydro ASA

(in \$ millions)	Norsk Hydro ASA			Howmet Aerospace Inc.			Alcoa Nederland Holding B.V.			Kaiser Aluminum Corporation		
	Baa2 Stable			Baa3 Positive			Ba1 Stable			B1 Stable		
	FY	FY	LTM	FY	FY	LTM	FY	FY	FY	FY	FY	LTM
	Dec-22	Dec-23	Mar-24	Dec-22	Dec-23	Mar-24	Dec-21	Dec-22	Dec-23	Dec-22	Dec-23	Mar-24
Revenue	21,717	18,355	18,131	5,663	6,640	6,861	12,152	12,451	10,551	3,428	3,087	3,017
EBITDA	4,235	2,127	2,068	1,401	1,574	1,648	3,065	2,319	339	144	210	239
Total Debt	4,165	4,462	4,460	5,302	4,923	4,938	2,253	2,120	2,290	1,095	1,103	1,104
EBIT Margin %	15.2%	6.7%	6.4%	19.1%	18.8%	19.3%	19.2%	13.3%	-3.2%	0.8%	3.0%	3.9%
EBIT / Avg. Tangible Assets	17.8%	6.7%	6.1%	17.4%	19.4%	20.7%	15.8%	11.2%	-2.4%	1.2%	4.2%	5.3%
EBIT / Interest Expense	19.8x	5.1x	4.6x	3.7x	4.5x	5.0x	11.6x	11.7x	-2.5x	0.5x	1.7x	2.1x
Debt / EBITDA	1.0x	2.0x	2.2x	3.8x	3.1x	3.0x	0.7x	0.9x	6.8x	7.6x	5.2x	4.6x
Debt / Total Capital	26.7%	28.8%	29.3%	58.4%	53.8%	53.6%	25.8%	23.8%	27.5%	63.4%	62.6%	61.9%
(CFO - Dividends) / Debt	37.1%	21.3%	12.1%	14.4%	18.0%	21.0%	58.1%	20.0%	2.1%	-9.5%	15.0%	22.6%

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

LTM = Last 12 months.

Source: Moody's Financial Metrics™

Exhibit 9

Moody's-adjusted debt reconciliation
Norsk Hydro ASA

(in NOK millions)	2019	2020	2021	2022	2023	LTM Mar-24
As reported debt	25,015.0	29,559.0	28,418.0	32,774.0	36,089.0	39,165.0
Pensions	15,534.2	19,167.0	9,621.0	8,252.0	9,222.0	9,222.0
Moody's-adjusted debt	40,549.2	48,726.0	38,039.0	41,026.0	45,311.0	48,387.0

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

Periods are financial year-end unless indicated. LTM = Last 12 months.

Source: Moody's Financial Metrics™

Exhibit 10

Moody's-adjusted EBITDA reconciliation
Norsk Hydro ASA

(in NOK millions)	2019	2020	2021	2022	2023	LTM Mar-24
As reported EBITDA	9,086.0	15,070.0	27,787.0	42,553.0	22,696.0	22,230.0
Pensions	(34.0)	(214.0)	(20.0)	32.0	32.0	32.0
Interest Expense – Discounting	(129.0)	(98.0)	(146.0)	(192.0)	(289.0)	(289.0)
Unusual Items	2,848.0	(7,441.0)	535.0	(1,843.0)	-	-
Moody's-adjusted EBITDA	11,771.0	7,317.0	28,156.0	40,550.0	22,439.0	21,973.0

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

Periods are financial year-end unless indicated. LTM = Last 12 months.

Source: Moody's Financial Metrics™

Exhibit 11

Overview on selected historical and forecasted Moody's-adjusted financial data

Norsk Hydro ASA

(in NOK millions)	2019	2020	2021	2022	2023	LTM Mar-24	2024F	2025F	2026F
INCOME STATEMENT									
Revenues	149,766	114,291	149,654	207,929	193,619	192,630	192,094	192,526	193,446
EBITDA	11,771	7,317	28,156	40,550	22,439	21,973	20,000	24,145	25,156
EBIT	3,198	142	20,312	31,622	13,044	12,292	9,978	13,835	14,627
Interest Expense	984	1,575	1,400	1,599	2,551	2,684	2,484	2,249	2,093
BALANCE SHEET									
Cash & Cash Equivalents	12,286	17,638	22,923	29,805	24,618	19,622	18,754	17,375	17,287
Total Debt	40,549	48,726	38,039	41,026	45,311	48,387	48,311	48,311	48,311
Net Debt	28,263	31,088	15,116	11,221	20,693	28,765	29,557	30,936	31,024
CASH FLOW									
Funds from Operations	7,711	11,264	16,960	36,466	17,686	15,622	14,405	18,149	18,984
Change in WC items	4,839	906	(6,280)	(7,073)	4,534	2,814	(1,000)	-	-
Cash Flow from Operations	12,550	12,170	10,680	29,393	22,220	18,436	13,405	18,149	18,984
Capital Expenditures	(9,834)	(6,260)	(6,864)	(10,913)	(15,168)	(15,613)	(17,530)	(16,530)	(16,530)
Dividends	(2,649)	(2,628)	(2,822)	(14,179)	(12,574)	(12,574)	(5,668)	(3,231)	(4,071)
Retained Cash Flow (RCF)	5,062	8,636	14,138	22,287	5,112	3,048	8,736	14,918	14,913
Free Cash Flow (FCF)	67	3,282	994	4,301	(5,522)	(9,751)	(9,794)	(1,612)	(1,617)
RCF / Debt	12.5%	17.7%	37.2%	54.3%	11.3%	6.3%	18.1%	30.9%	30.9%
FCF / Debt	0.2%	6.7%	2.6%	10.5%	-12.2%	-20.2%	-20.3%	-3.3%	-3.3%
(CFO - Dividends) / Debt	24.4%	19.6%	20.7%	37.1%	21.3%	12.1%	16.0%	30.9%	30.9%
PROFITABILITY									
EBIT Margin %	2.1%	0.1%	13.6%	15.2%	6.7%	6.4%	5.2%	7.2%	7.6%
EBITDA Margin %	7.9%	6.4%	18.8%	19.5%	11.6%	11.4%	10.4%	12.5%	13.0%
INTEREST COVERAGE									
EBIT / Interest Expense	3.2x	0.1x	14.5x	19.8x	5.1x	4.6x	4.0x	6.2x	7.0x
EBITDA / Interest Expense	12.0x	4.6x	20.1x	25.4x	8.8x	8.2x	8.1x	10.7x	12.0x
LEVERAGE									
Debt / EBITDA	3.4x	6.7x	1.4x	1.0x	2.0x	2.2x	2.4x	2.0x	1.9x
Net Debt / EBITDA	2.4x	4.2x	0.5x	0.3x	0.9x	1.3x	1.5x	1.3x	1.2x
Debt / Total Capital	31.4%	37.7%	29.2%	26.7%	28.8%	29.3%	30.8%	29.9%	29.1%

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustment for Non-Financial Corporations.

Periods are financial year-end unless indicated. LTM = Last 12 months.

Moody's forecasts are Moody's opinion and do not represent the views of the issuer.

Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

Ratings

Exhibit 12

Category	Moody's Rating
NORSK HYDRO ASA	
Outlook	Stable
Issuer Rating - Dom Curr	Baa2
Senior Unsecured	Baa2

Source: Moody's Ratings

© 2024 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved. CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED OR OTHERWISE MADE AVAILABLE BY MOODY'S (COLLECTIVELY, "MATERIALS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S MATERIALS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S MATERIALS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES OR OTHERWISE MAKES AVAILABLE ITS MATERIALS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND MATERIALS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR MATERIALS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. FOR CLARITY, NO INFORMATION CONTAINED HEREIN MAY BE USED TO DEVELOP, IMPROVE, TRAIN OR RETRAIN ANY SOFTWARE PROGRAM OR DATABASE, INCLUDING, BUT NOT LIMITED TO, FOR ANY ARTIFICIAL INTELLIGENCE, MACHINE LEARNING OR NATURAL LANGUAGE PROCESSING SOFTWARE, ALGORITHM, METHODOLOGY AND/OR MODEL.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the credit rating process or in preparing its Materials.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it. MCO and Moody's Investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service, Inc. and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moody's.com under the heading "Investor Relations — Corporate Governance — Charter Documents - Director and Shareholder Affiliation Policy."

Moody's SF Japan K.K., Moody's Local AR Agente de Calificación de Riesgo S.A., Moody's Local BR Agência de Classificação de Risco LTDA, Moody's Local MX S.A. de C.V., I.C.V., Moody's Local PE Clasificadora de Riesgo S.A., and Moody's Local PA Calificadora de Riesgo S.A. (collectively, the "Moody's Non-NRSRO CRAs") are all indirectly wholly-owned credit rating agency subsidiaries of MCO. None of the Moody's Non-NRSRO CRAs is a Nationally Recognized Statistical Rating Organization.

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for India only: Moody's credit ratings, Assessments, other opinions and Materials are not intended to be and shall not be relied upon or used by any users located in India in relation to securities listed or proposed to be listed on Indian stock exchanges.

Additional terms with respect to Second Party Opinions (as defined in Moody's Investors Service Rating Symbols and Definitions): Please note that a Second Party Opinion ("SPO") is not a "credit rating". The issuance of SPOs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs fall under the category of "Ancillary Businesses", not "Credit Rating Business", and are not subject to the regulations applicable to "Credit Rating Business" under the Financial Instruments and Exchange Act of Japan and its relevant regulation. PRC: Any SPO: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.