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CREDIT OPINION
11 May 2023

Update

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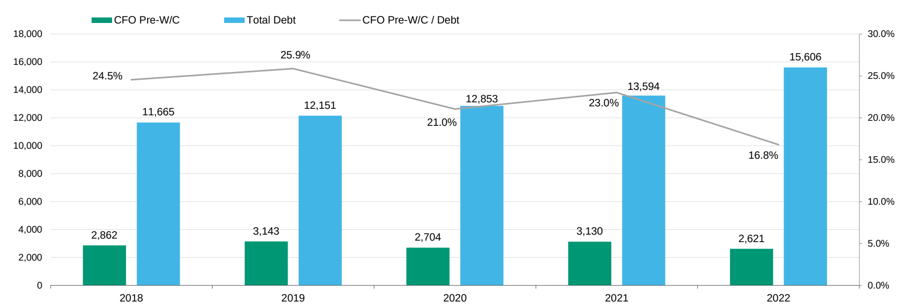
Duke Energy Carolinas, LLC

Update to credit analysis

Summary

Duke Energy Carolinas' (Duke Carolinas) credit reflects its low business and operating risk profile and supportive regulatory environments in both North and South Carolina. Our view also considers the company's position as the largest subsidiary within the Duke Energy Corporation (Duke, Baa2 stable) family, making up about a third of its rate base. North Carolina's House Bill (HB) 951, signed into law in October 2021 to guide the states clean energy transition, will be an important driver of the company's credit quality going forward. Over the next two years, we expect Duke Carolinas to maintain credit metrics that are supportive of its current A2 credit rating, including a ratio of cash flow from operations excluding changes in working capital (CFO pre-WC) to debt sustained in the low 20% range.

Exhibit 1
Historical CFO Pre-WC, Total Debt and CFO Pre-WC to Debt ($ MM)



Note: The 2022 CFO pre-WC to debt ratio, excluding the financial impact of storm cost securitization and the cash flow impact of deferred fuel costs which we expect to be recovered by the end of 2024, would have been 21.3%, see Exhibit 3 for details.
Source: Moody's Financial Metrics™

Credit Strengths

» Credit supportive regulatory environments

» New multiyear performance based ratemaking (PBR) framework in North Carolina could reduce regulatory lag

» Growing service territories

Credit Challenges

» Weakened financial metrics

» Regulatory lag due to lack of rider/tracker mechanisms for cost recovery

RATINGS

Duke Energy Carolinas, LLC

Domicile	Charlotte, North Carolina, United States
Long Term Rating	A2
Type	LT Issuer Rating
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.

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» High capital expenditures

» Storm prone service territory

Rating Outlook

The stable outlook recognizes Duke Carolinas' supportive regulatory relationships in North and South Carolina and an improving regulatory framework in North Carolina. The stable outlook assumes that the utility will recover its prudently incurred costs in a relatively timely manner, and that the company will fund its significant capital program in a manner that supports its balance sheet. The stable outlook further assumes that Duke Carolinas will demonstrate credit metrics that are supportive of its credit rating, including a ratio of cash flow from operations excluding changes in working capital (CFO pre-WC) to debt in the low 20% range.

Factors that Could Lead to an Upgrade

» Credit positive changes in the utility's regulatory framework, including more riders and trackers to reduce regulatory lag and improve cash flow.

» Increased cash flow, or a reduction in leverage, enabling the company to maintain a ratio of CFO pre-WC to debt of around 25% or above.

Factors that Could Lead to a Downgrade

» A decline in the credit supportiveness of Duke Carolinas' regulatory relationships in North or South Carolina.

» Additional capital expenditures or other capital needs that result in a material increase in debt levels or are not recoverable.

» A ratio of CFO pre-WC to debt, excluding the financial effects of storm cost securitization, remaining below 21% on a sustained basis.

Key Indicators

Exhibit 2

Duke Energy Carolinas, LLC [1]

	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22
CFO Pre-W/C + Interest / Interest	6.9x	7.3x	6.2x	6.5x	5.3x
CFO Pre-W/C / Debt	24.5%	25.9%	21.0%	23.0%	16.8%
CFO Pre-W/C – Dividends / Debt	18.1%	23.6%	16.4%	18.6%	16.5%
Debt / Capitalization	43.3%	42.2%	43.1%	43.7%	44.4%

[1]All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Note: The 2022 CFO pre-WC to debt ratio, excluding the financial impact of storm cost securitization and the cash flow impact of deferred fuel costs which we expect to be recovered by the end of 2024, would have been 21.3%, see Exhibit 3 for details.
Source: Moody's Financial Metrics™

Profile

Duke Carolinas is a vertically integrated electric utility serving approximately 2.8 million customers in North Carolina (about 2 million) and South Carolina. The utility is the largest subsidiary of Duke and is regulated by the North Carolina Utilities Commission (NCUC) and the Public Service Commission of South Carolina (PSCSC).

Detailed Credit Considerations

Credit supportive regulatory environments

The regulatory environments in both North and South Carolina have historically been credit supportive with regard to rate decisions, ultimate recovery of prudently incurred costs, authorized returns and equity layers. Utilities have been able to reach settlement agreements on traditional rate making parameters, which we view positively, leaving only more contentious items, such as the recovery of coal ash remediation spending, to be fully litigated. In January 2021, Duke Carolinas reached a settlement agreement in North Carolina with key intervenors resolving all prior issues regarding coal ash and establishing a framework for future recovery.

Despite this generally collaborative environment, utilities in North and South Carolina do not benefit from tracking mechanisms that could serve to reduce regulatory lag on investment in their systems or to speed the recovery of coal ash remediation spending. However, North Carolina's new performance-based ratemaking (PBR) framework, as authorized in HB 951, is a positive development towards mitigating regulatory lag.

North Carolina – HB 951, signed into law in October 2021, directs the North Carolina Utilities Commission (NCUC), in collaboration with the state's utilities and other stakeholders, to develop a plan to reduce carbon emissions by 70% by 2030 relative to 2005 levels and achieve carbon neutrality by 2050 via the least cost means, while maintaining reliability. It also allows Duke's North Carolina utilities to own and rate base 55% of commission approved new solar generation facilities and fully rate base all other approved new sources of generation. For early subcritical coal power plant retirements, the law allows for the securitization of 50% of the remaining net book value. In addition, the law authorizes the NCUC to consider multiyear rate plans (MYRP) and PBR as well as revenue decoupling, a mechanism we view as credit positive, for residential customers.

Pursuant to HB 951, Duke Carolinas filed its first PBR application with the NCUC in January 2023, requesting recovery of forecast capital expenditures over a three-year MYRP period. The company requested an $823 million revenue increase over three years, including a $501 million increase for the first year effective 1 January 2024, $172 million for the second year and $150 million for the third year. The request is based on a 10.4% ROE and 53% equity layer. The PBR application includes an earnings sharing mechanism, a residential decoupling mechanism and performance based incentives as authorized under HB 951. Duke Carolinas requested that interim rates be made effective on 1 September 2023.

In January 2021, Duke announced a settlement agreement with the North Carolina Attorney General's Office, the Public Staff and the Sierra Club that resolved all issues surrounding historical coal ash remediation prudence and cost recovery in the state. The settlement, approved in March 2021, affirmed the cost recovery provisions for coal ash spending that were approved in the NCUC's 2018 rate decision, which included a five year amortization period with a full debt and equity return. Duke Carolinas was also authorized to recover approved coal ash costs in its 2019 rate case over five years and earn a debt and equity return on the deferred balance; however the equity rate earned during the amortization period was set 150 basis points below the 9.6% ROE approved in the 2019 rate case.

The coal ash settlement also limits the scope of future rate proceedings and establishes that, through 2030, the company will continue to be able to earn a debt and equity return for coal ash remediation spending, with the equity rate set at 150 basis points below the prevailing ROE. As part of the settlement, Duke Carolinas agreed not to seek recovery of a portion of its deferred coal ash expenditures and, as a result, the company recorded an estimated $454 million pre-tax impairment charge and refunded approximately $50 million of previously collected wholesale revenues. This represents a sharing of costs with shareholders and was a provision sought by parties to the settlement.

In May 2021, the NCUC approved the securitization of deferred storm costs at Duke Carolinas and issued an order allowing the company to issue storm recovery bonds to recover $237 million of storm costs, including carrying and financing costs, over a period of 20 years. The bonds were issued in November 2021.

South Carolina - (approximately 25% of rate base) The PSCSC's May 2019 order in Duke Carolinas' most recent rate case denied recovery of the majority of the company's incremental South Carolina allocated spending on coal ash remediation because the incremental costs were a result of North Carolina's coal ash law. However, the balance of the order (which included an approved 53% equity ratio) was generally credit supportive. The company appealed the coal ash disallowance to the Supreme Court of South Carolina. On 27 October 2021, the Supreme Court affirmed the PSCSC's May 2019 order disallowing recovery of certain CCR compliance and coal ash insurance litigation costs. Consequently, Duke Carolinas recognized approximately $160 million of impairment charges and a $31 million increase in other income for fiscal year 2021. In February 2022, the South Carolina Supreme Court denied a petition for rehearing, filed by Duke Carolinas in November 2021, on several issues including the decision on coal ash cost recovery.

On a more positive note, the South Carolina order continued authorization of the utility's ability to earn a full weighted average cost of capital return on its previously approved coal ash remediation spending. The order also shortened the recovery period to five years, versus a previously approved fifteen years.

Financial metrics expected to recover and remain supportive of the current credit rating

Duke Carolinas' historically strong financial coverage metrics have declined materially in recent years, including a ratio of CFO pre-WC to debt falling from 25% in 2018 and 2019 to around 22% in 2020 and 2021 and 17% in 2023. Drivers of this decline have included spending for coal ash remediation, new generation and grid modernization, as well as the negative cash flow impact of tax reform, the coronavirus pandemic and unusually severe storms.

Going forward, we expect the company's credit metrics to recover from the low levels exhibited in 2023, with CFO pre-WC to debt returning the low 20% range. Nevertheless, recovery of ongoing coal ash remediation spending (which still must be recovered via general base rate case proceedings) and elevated spending for grid modernization and generation transition investments will continue to maintain pressure on credit metrics. Our analysis focuses on financial metrics that exclude the impacts of storm cost securitization debt because Duke Carolinas simply acts as a conduit for the repayment of a customer obligation as mandated by law.

The company's 2022 credit metrics were particularly weak, including a ratio of CFO pre-WC/debt of 17% when adjusted for securitization, primarily due to significant deferred fuel costs. After adjusting for the cash flow impact of deferred fuel costs, substantially all which we expect to be recovered by the end of 2024, the CFO pre-WC to debt ratio would have been 21.3% as shown below. Duke Carolinas has filed for recovery of these fuel costs over a 12 month period effective September 2023. A final commission order is expected in August 2023.

Exhibit 3
Duke Carolinas adjusted 2022 CFO pre-WC to debt detail

	2022
Cash flow from operations (GAAP)	1,569
Exclude changes in current assets/liabilites (working capital)	867
Unadjusted CFO pre-WC	2,436
Primary adjustments	
Lease	35
Capitalized Interest	(50)
ARO (Coal Ash)	200
Other analyst adjustments	
Securitization	(12)
LT deferred fuel costs	668
Preliminary adjusted CFO pre-WC (excl. other analyst adjustments)	**2,621**
Fully adjusted CFO pre-WC (incl. other analyst adjustments)	**3,277**
Debt (GAAP)	15,499
Primary adjustments	
Pension	10
Lease	97
Other analyst adjustments	
Securitization	(228)
Preliminary adjusted debt (excluding other analyst adjustments)	**15,606**
Fully adjusted debt (including other analyst adjustments)	**15,378**
Preliminary adjusted CFO pre-WC/debt	**16.8%**
Fully adjusted CFO pre-WC/debt	**21.3%**

Source: Moody's Investors Service, Company

Our analysis of Duke Carolinas credit includes the impact of its current settlement agreements in North Carolina. Our calculation of Duke Carolinas' credit metrics reflects our treatment of coal ash remediation expenditures as akin to a capital investment rather than an operating expense. We have taken this view in light of the fact that the company has been allowed to earn a debt and equity return on its approved deferral balances. Although the settlement incorporates a discount to the equity return, bringing it to 150 basis points below the prevailing ROE, we recognize that regulatory commissions have the discretion to establish different ROEs for particular investments, or for use in various riders.

Capital expenditures to remain elevated

Capital expenditures (inclusive of coal ash remediation spending) at Duke Carolinas have been on the rise, and were $3.5 billion in 2022, up from $2.9 billion in 2021. Going forward, the company's current five year capital plan includes average annual spending of about $4.1 billion, as it spends more for electric distribution, new generation and grid modernization investments in transmission.

Pursuant to the HB 951 requirement that the NCUC develop, together with the state's utilities, a plan to reduce carbon emissions by 70% by 2030 and achieve carbon neutrality by 2050, Duke Carolinas and sister company Duke Energy Progress, LLC (A2 stable) filed an initial carbon plan with the NCUC in May 2022. In December 2022, the NCUC issued an order adopting an initial carbon plan, with near-term procurement and development action items. North Carolina's carbon reduction plan will drive a substantial portion of Duke and its Carolina utilities' capital expenditures going forward.

Although HB 951 is North Carolina legislation, we expect Duke Carolinas to also work with regulators in South Carolina to achieve its carbon reduction goals without cost recovery disallowances as occurred with coal ash cost recovery in the company's 2019 South Carolina rate case order.

Ongoing coal ash remediation

Duke has continued to refine its estimates of coal ash remediation spending since it first recognized an asset retirement obligation in 2014. In December 2019, the company reached an agreement with the North Carolina Department of Environmental Quality (NCDEQ) establishing the means and time frames for remediation of its remaining coal ash basins. The settlement calls for the full excavation of the majority of the ash over a period of 15-20 years. As of 31 December 2022, Duke Carolinas' total remaining coal ash related asset retirement obligation was estimated at about $2.3 billion. Payments for coal ash related asset retirement obligations were $182 million in 2021 and $200 million in 2022. Going forward, the company forecasts environmental spending, inclusive of coal ash remediation, to be at a level of around $200-$275 million per year.

Duke Carolinas' coal ash basin closure and remediation spending is not recovered via trackers or other automatic cost recovery provisions and must be recovered via base rate case filings. As a result, there will likely continue to be regulatory lag in the recovery of these costs.

ESG considerations

Duke Carolinas' ESG Credit Impact Score is CIS-3 (Moderately Negative)

Exhibit 4
ESG Credit Impact Score

CIS-3
Moderately Negative

For an issuer scored CIS-3 (Moderately Negative), its ESG attributes are overall considered as having a limited impact on the current rating, with greater potential for future negative impact over time. The negative influence of the overall ESG attributes on the rating is more pronounced compared to an issuer scored CIS-2.

Source: Moody's Investors Service

Duke Carolinas' ESG Credit Impact Score is moderately negative (**CIS-3**), where its ESG attributes are overall considered as having a limited impact on the current rating, with greater potential for future negative impact over time. Duke Carolinas' **CIS-3** reflects highly negative environmental risk, moderately negative social risk and neutral to low governance risk.

Exhibit 5
ESG Issuer Profile Scores

ENVIRONMENTAL	SOCIAL	GOVERNANCE
E-4	S-3	G-2
Highly Negative	Moderately Negative	Neutral-to-Low

Source: Moody's Investors Service

Environmental
Duke Carolinas' highly negative exposure to environmental risk (**E-4** issuer profile score) reflects the vulnerability of its service territory to hurricanes and tropical storms which can cause costly damage to physical assets. The company's fossil fuel generation fleet presents moderate exposure to carbon transition risk, and its coal and nuclear fleets also expose the company to moderate risks of waste management and pollution. Risks associated with water management and natural capital are neutral to the company's credit profile.

Social
Duke Carolinas' exposure to social risks is moderately negative (**S-3** issuer profile score) because the operation of nuclear facilities heightens the risk of responsible production, while demographics and societal trends that increase public concern over environmental, social, or affordability issues could lead to adverse regulatory or political intervention. Risks related to customer relations, employee health and safety and human capital are neutral to the company's credit profile.

Governance
Duke Carolinas' **G-2** governance issuer profile score is driven by that of its parent Duke. Duke's governance (**G-2** issuer profile score) is broadly in line with other utilities and does not pose a particular risk. Duke Carolinas' governance profile is supported by neutral to low risks associated with financial strategy and risk management, management credibility and track record, organizational structure, compliance and reporting and board structure policies and procedures.

ESG Issuer Profile Scores and Credit Impact Scores for Duke Carolinas are available on Moodys.com. In order to view the latest scores, please click here to go to the landing page for Duke Carolinas on Moodys.com and view the ESG Scores section.

Liquidity Analysis
We expect Duke Carolinas to maintain adequate liquidity. For the year ended 31 December 2022, Duke Carolinas generated approximately $1.6 billion of cash from operations (CFO), invested approximately $3.3 billion in capital expenditures (excluding coal ash remediation spending) and upstreamed $50 million in dividend payments to parent Duke, resulting in negative free cash flow (FCF) of about $1.8 billion. Going forward, we expect Duke Carolinas to remain cash flow negative with cash shortfalls funded via a combination of internal and external sources.

Duke Carolinas' liquidity sources include access to funding from Duke's commercial paper program through the Duke system money pool, and direct borrowings from the money pool. As of 31 December 2022, the utility had $1.925 billion of borrowing capacity under Duke's $9 billion master credit facility. As of 31 December 2022, the utility had around $1.5 billion of commercial paper outstanding, and $4 million of letters of credit outstanding, reducing its available capacity under the parent master credit facility to approximately $388 million.

Duke's master credit facility terminates in March 2028. The facility does not contain a material adverse change clause for new borrowings and has a single financial covenant requiring that Duke and its utility subsidiaries each maintain a consolidated debt to capitalization ratio of no more than 65%, except for Piedmont Natural Gas Company (Piedmont). The debt to capitalization covenant for Piedmont is a maximum of 70%. As of 31 December 2022, Duke reported that all entities were in compliance with the covenant and we estimate Duke Carolinas' ratio was about 50%.

Duke Carolinas' nearest long-term debt maturity is $471 million of account receivable securitization debt due in January 2025.

Rating Methodology and Scorecard Factors

Exhibit 6

Methodology Scorecard Factors

Duke Energy Carolinas, LLC

Regulated Electric and Gas Utilities Industry Scorecard [1][2]	Current FY 12/31/2022		Moody's 12-18 Month Forward View As of Date Published [3]	
Factor 1 : Regulatory Framework (25%)	**Measure**	**Score**	**Measure**	**Score**
a) Legislative and Judicial Underpinnings of the Regulatory Framework	A	A	A	A
b) Consistency and Predictability of Regulation	Aa	Aa	Aa	Aa
Factor 2 : Ability to Recover Costs and Earn Returns (25%)				
a) Timeliness of Recovery of Operating and Capital Costs	A	A	A	A
b) Sufficiency of Rates and Returns	A	A	A	A
Factor 3 : Diversification (10%)				
a) Market Position	A	A	A	A
b) Generation and Fuel Diversity	A	A	A	A
Factor 4 : Financial Strength (40%)				
a) CFO pre-WC + Interest / Interest (3 Year Avg)	6.0x	A	5.5x - 6.5x	Aa
b) CFO pre-WC / Debt (3 Year Avg)	20.1%	Baa	20% - 22%	Baa
c) CFO pre-WC – Dividends / Debt (3 Year Avg)	17.1%	A	15% - 20%	A
d) Debt / Capitalization (3 Year Avg)	43.8%	A	40% - 45%	A
Rating:				
Scorecard-Indicated Outcome Before Notching Adjustment		A2		A2
HoldCo Structural Subordination Notching		0		0
a) Scorecard-Indicated Outcome		A2		A2
b) Actual Rating Assigned		A2		A2

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
[2] As of 12/31/2022
[3] This represents Moody's forward view; not the view of the issuer; and unless noted in the text, does not incorporate significant acquisitions and divestitures.
Source: Moody's Financial Metrics™

Appendix

Exhibit 7

Cash Flow and Credit Metrics [1]

CF Metrics	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22
As Adjusted					
FFO	**3,129**	**3,230**	**2,857**	**2,993**	**3,421**
+/- Other	-267	-87	-153	137	-800
CFO Pre-WC	**2,862**	**3,143**	**2,704**	**3,130**	**2,621**
+/- ΔWC	-96	-144	255	-233	-867
CFO	**2,766**	**2,999**	**2,959**	**2,897**	**1,754**
- Div	750	275	600	600	50
- Capex	2,942	3,010	2,860	2,891	3,495
FCF	**-926**	**-286**	**-501**	**-594**	**-1,791**
(CFO Pre-W/C) / Debt	24.5%	25.9%	21.0%	23.0%	16.8%
(CFO Pre-W/C - Dividends) / Debt	18.1%	23.6%	16.4%	18.6%	16.5%
FFO / Debt	26.8%	26.6%	22.2%	22.0%	21.9%
RCF / Debt	20.4%	24.3%	17.6%	17.6%	21.6%
Revenue	7,300	7,395	7,015	7,102	7,857
Interest Expense	482	498	519	571	611
Net Income	1,025	1,348	1,267	1,442	1,504
Total Assets	40,121	44,023	45,020	47,133	50,296
Total Liabilities	28,542	31,315	31,888	33,265	34,894
Total Equity	11,579	12,708	13,132	13,868	15,403

[1] All figures and ratios are calculated using Moody's estimates and standard adjustments. Periods are Financial Year-End unless indicated. LTM = Last Twelve Months
Source: Moody's Financial Metrics™

Exhibit 8

Peer Comparison Table [1]

	Duke Energy Carolinas, LLC A2 (Stable)			Duke Energy Progress, LLC A2 (Stable)			Virginia Electric and Power Company A2 (Stable)			Alabama Power Company A1 (Stable)		
(In US millions)	FYE Dec-20	FYE Dec-21	FYE Dec-22	FYE Dec-20	FYE Dec-21	FYE Dec-22	FYE Dec-20	FYE Dec-21	FYE Dec-22	FYE Dec-20	FYE Dec-21	FYE Dec-22
Revenue	7,015	7,102	7,857	5,422	5,780	6,753	7,763	7,470	9,654	5,830	6,413	7,817
CFO Pre-W/C	2,704	3,130	2,621	1,798	2,240	2,061	2,960	3,374	3,543	2,276	2,287	2,202
Total Debt	12,853	13,594	15,606	9,940	10,852	12,253	15,022	16,061	19,528	9,257	9,957	10,711
CFO Pre-W/C + Interest / Interest	6.2x	6.5x	5.3x	7.3x	8.0x	6.0x	5.8x	6.0x	5.7x	7.5x	7.4x	6.7x
CFO Pre-W/C / Debt	21.0%	23.0%	16.8%	18.1%	20.6%	16.8%	19.7%	21.0%	18.1%	24.6%	23.0%	20.6%
CFO Pre-W/C – Dividends / Debt	16.4%	18.6%	16.5%	14.1%	14.2%	14.8%	16.8%	19.1%	18.1%	14.3%	13.2%	11.1%
Debt / Capitalization	43.1%	43.7%	44.4%	46.2%	48.0%	49.0%	46.5%	45.7%	48.7%	41.0%	40.8%	40.6%

[1] All figures & ratios calculated using Moody's estimates & standard adjustments. FYE = Financial Year-End. LTM = Last Twelve Months. RUR* = Ratings under Review, where UPG = for upgrade and DNG = for downgrade
Source: Moody's Financial Metrics™

Ratings

Exhibit 9

Category	Moody's Rating
DUKE ENERGY CAROLINAS, LLC	
Outlook	Stable
Issuer Rating	A2
First Mortgage Bonds	Aa3
Senior Secured Shelf	(P)Aa3
Senior Unsecured	A2
PARENT: DUKE ENERGY CORPORATION	
Outlook	Stable
Issuer Rating	Baa2
Sr Unsec Bank Credit Facility	Baa2
Senior Unsecured	Baa2
Jr Subordinate	Baa3
Pref. Stock	Ba1
Commercial Paper	P-2

Source: Moody's Investors Service

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