

ATLIQ MOTORS



Electric Vehicle Sales Insight



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Problem Statement

- AtliQ Motors is an automotive giant from the USA specializing in electric vehicles (EV). In the last 5 years, their market share rose to 25% in electric and hybrid vehicles segment in North America. As a part of their expansion plans, they wanted to launch their bestselling models in India where their market share is less than 2%. Bruce Haryali, the chief of AtliQ Motors India wanted to do a detailed market study of existing EV/Hybrid market in India before proceeding further. Bruce gave this task to the data analytics team of AtliQ motors and Peter Pandey is the data analyst working in this team.



Few Key Points:

Company works on Fiscal year-

Fiscal Year: The fiscal year is a one-year period used for financial reporting and budgeting, starting on April 1st and ending on March 31st of the following year in India.

Penetration Rate: This metric represents the percentage of total vehicles that are electric within a specific region or category. It is calculated as:

$$\text{Penetration Rate} = (\text{Electric Vehicles Sold} / \text{Total Vehicles Sold}) * 100$$

This indicates the adoption level of electric vehicles.

Compound Annual Growth Rate (CAGR): CAGR measures the mean annual growth rate over a specified period longer than one year. It is calculated as:

$$\text{CAGR} = [(\text{Ending Value} / \text{Beginning Value})^{**} 1/n] - 1$$

Preliminary Research Questions:



- List the top 3 and bottom 3 makers for the fiscal years 2023 and 2024 in terms of the number of 2-wheelers sold.

Year	Maker	Electric Vehicles Sales	Rank	Year	Maker	Electric Vehicles Sales	Rank
2023	JITENDRA	8563	1	2023	OLA	152583	1
2023	BEING	11018	2	2023	ELECTRIC	96945	2
2023	PURE EV	11556	3	2023	OKINAWA	88993	3
	BATTRE			2023	HERO		
2024	ELECTRIC	4841	1	2024	ELECTRIC	322489	1
2024	REVOLT	7254	2	2024	TVS	180743	2
	KINETIC			2024	ATHER	107552	3
2024	GREEN	9585	3				

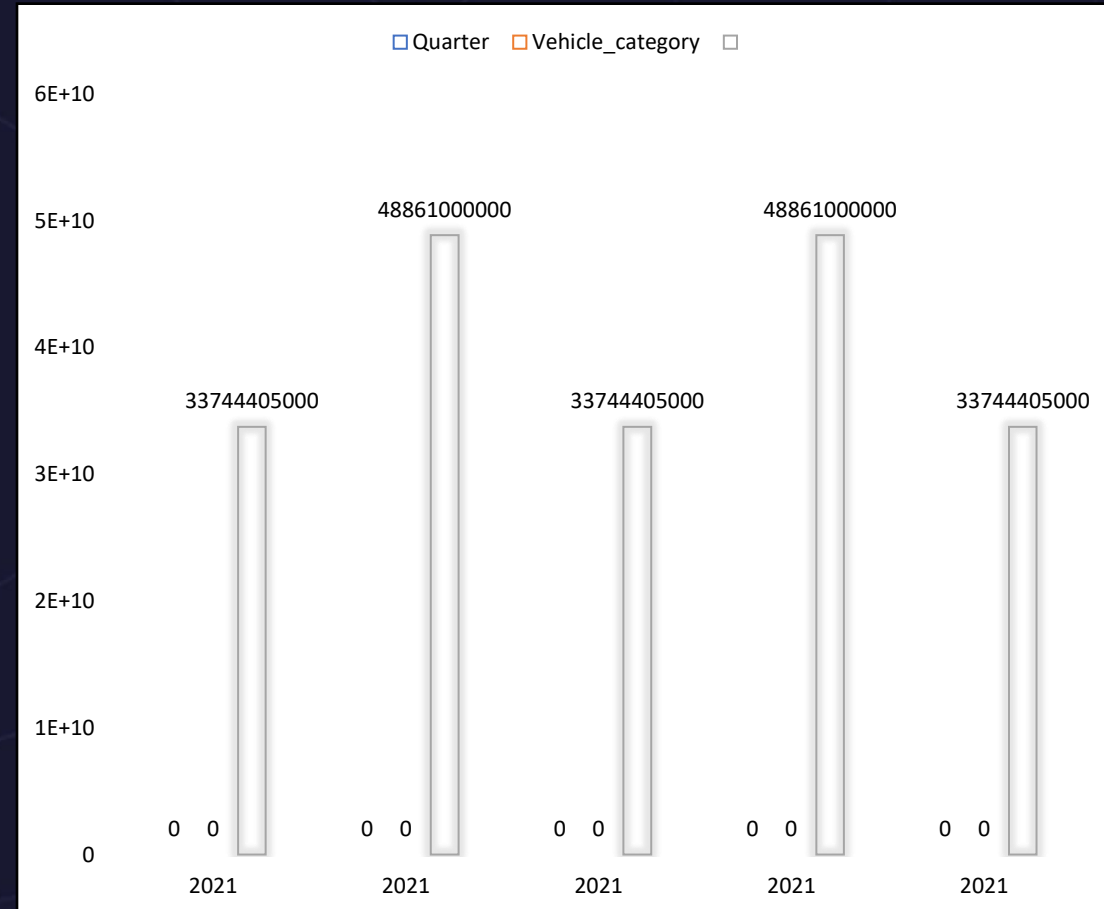
Bottom 3 Makers By Sales

Top 3 Makers by sales

Identify the top 5 states with the highest penetration rate in 2-wheeler and 4-wheeler EV sales in FY 2024.



State	Electric Vehicles Sold	Total Vehicles Sold	Penetration Rate
Goa	10799	78524	13.75
Kerala	73938	638114	11.59
Karnataka	160989	1581988	10.18
Maharashtra	197169	2293994	8.6
Delhi	46724	606348	7.71



List the states with negative penetration (decline) in EV sales from 2022 to 2024?



State	Penetration Rate 2022	Penetration Rate 2022	Penetration Rate 2022	Trend 2023	Trend 2024
Rajasthan	2.28	5.67	5.11	3.39	-0.56
Haryana	1.12	2.04	1.61	0.92	-0.43
Uttarakhand	1.2	3.1	2.72	1.9	-0.38
Gujarat	1.65	5.49	5.3	3.84	-0.19
Jharkhand	0.66	1.73	1.58	1.07	-0.15
Himachal Pradesh	0.45	1	0.9	0.55	-0.1
Sikkim	0	0	0	0	0
Nagaland	0.01	0.02	0.05	0.01	0.03
Jammu and Kashmir	1.07	1.6	1.64	0.53	0.04
Andhra Pradesh	1.8	4.16	4.24	2.36	0.08

What are the quarterly trends based on sales volume for the top 5 EV makers (4-wheelers) from 2022 to 2024



Year	Quarter	Maker	Sales	Previous Quarter Sales	Quarterly Trend
2022	Q1	BYD India	0	0	0
2022	Q2	BYD India	0	0	0
2022	Q3	BYD India	1	0	1
2022	Q4	BYD India	32	1	31
2023	Q1	BYD India	81	32	49
2023	Q2	BYD India	113	81	32
2023	Q3	BYD India	103	113	-10
2023	Q4	BYD India	623	103	520
2024	Q1	BYD India	406	623	-217
2024	Q2	BYD India	310	406	-96
2024	Q3	BYD India	350	310	40
2024	Q4	BYD India	400	350	50
2022	Q1	Hyundai Motor	25	0	25
2022	Q2	Hyundai Motor	34	25	9
2022	Q3	Hyundai Motor	25	34	-9
2022	Q4	Hyundai Motor	26	25	1
2023	Q1	Hyundai Motor	75	26	49
2023	Q2	Hyundai Motor	155	75	80
2023	Q3	Hyundai Motor	191	155	36
2023	Q4	Hyundai Motor	155	191	-36
2024	Q1	Hyundai Motor	292	155	137
2024	Q2	Hyundai Motor	390	292	98
2024	Q3	Hyundai Motor	370	390	-20
2024	Q4	Hyundai Motor	338	370	-32

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Year	Quarter	Maker	Sales	Previous Quarter Sales	Quarterly Trend
2022	Q1	Mahindra & Mahindra	355	0	355
2022	Q2	Mahindra & Mahindra	651	355	296
2022	Q3	Mahindra & Mahindra	1383	651	732
2022	Q4	Mahindra & Mahindra	1653	1383	270
2023	Q1	Mahindra & Mahindra	2020	1653	367
2023	Q2	Mahindra & Mahindra	3164	2020	1144
2023	Q3	Mahindra & Mahindra	3378	3164	214
2023	Q4	Mahindra & Mahindra	5243	3378	1865
2024	Q1	Mahindra & Mahindra	10911	5243	5668
2024	Q2	Mahindra & Mahindra	5855	10911	-5056
2024	Q3	Mahindra & Mahindra	4264	5855	-1591
2024	Q4	Mahindra & Mahindra	2316	4264	-1948
2022	Q1	MG Motor	285	0	285
2022	Q2	MG Motor	798	285	513
2022	Q3	MG Motor	411	798	-387
2022	Q4	MG Motor	153	411	-258
2023	Q1	MG Motor	531	153	378
2023	Q2	MG Motor	635	531	104
2023	Q3	MG Motor	1165	635	530
2023	Q4	MG Motor	946	1165	-219
2024	Q1	MG Motor	1493	946	547
2024	Q2	MG Motor	2524	1493	1031
2024	Q3	MG Motor	2190	2524	-334
2024	Q4	MG Motor	2622	2190	432

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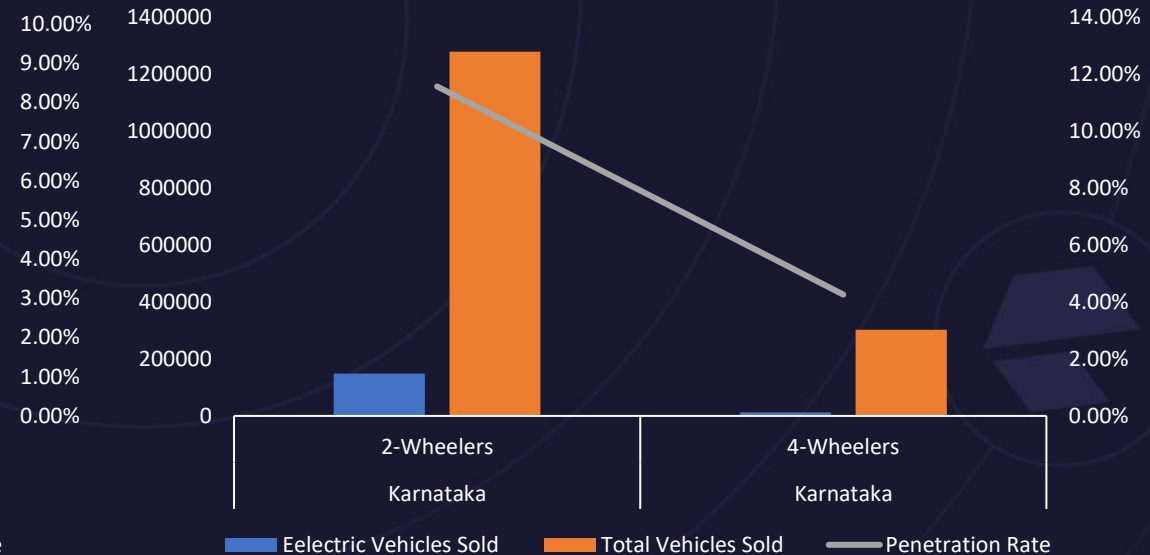
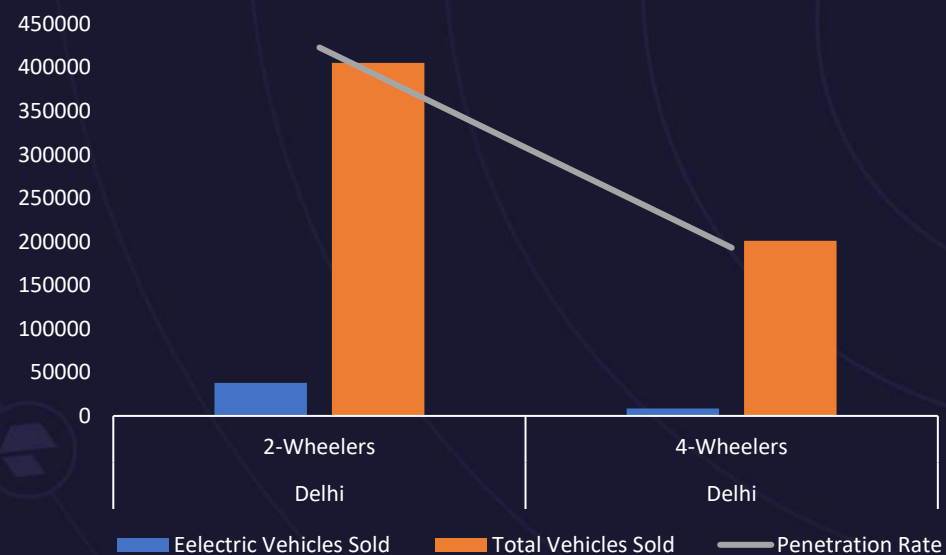


Year	Quarter	Maker	Sales	Previous Quarter	
				Sales	Quarterly Trend
2022	Q1	Tata Motors	1031	0	1031
2022	Q2	Tata Motors	2052	1031	1021
2022	Q3	Tata Motors	3791	2052	1739
2022	Q4	Tata Motors	5834	3791	2043
2023	Q1	Tata Motors	5675	5834	-159
2023	Q2	Tata Motors	6192	5675	517
2023	Q3	Tata Motors	6651	6192	459
2023	Q4	Tata Motors	9528	6651	2877
2024	Q1	Tata Motors	7247	9528	-2281
2024	Q2	Tata Motors	10337	7247	3090
2024	Q3	Tata Motors	13236	10337	2899
2024	Q4	Tata Motors	17361	13236	4125

How do the EV sales and penetration rates in Delhi compare to Karnataka for 2024?



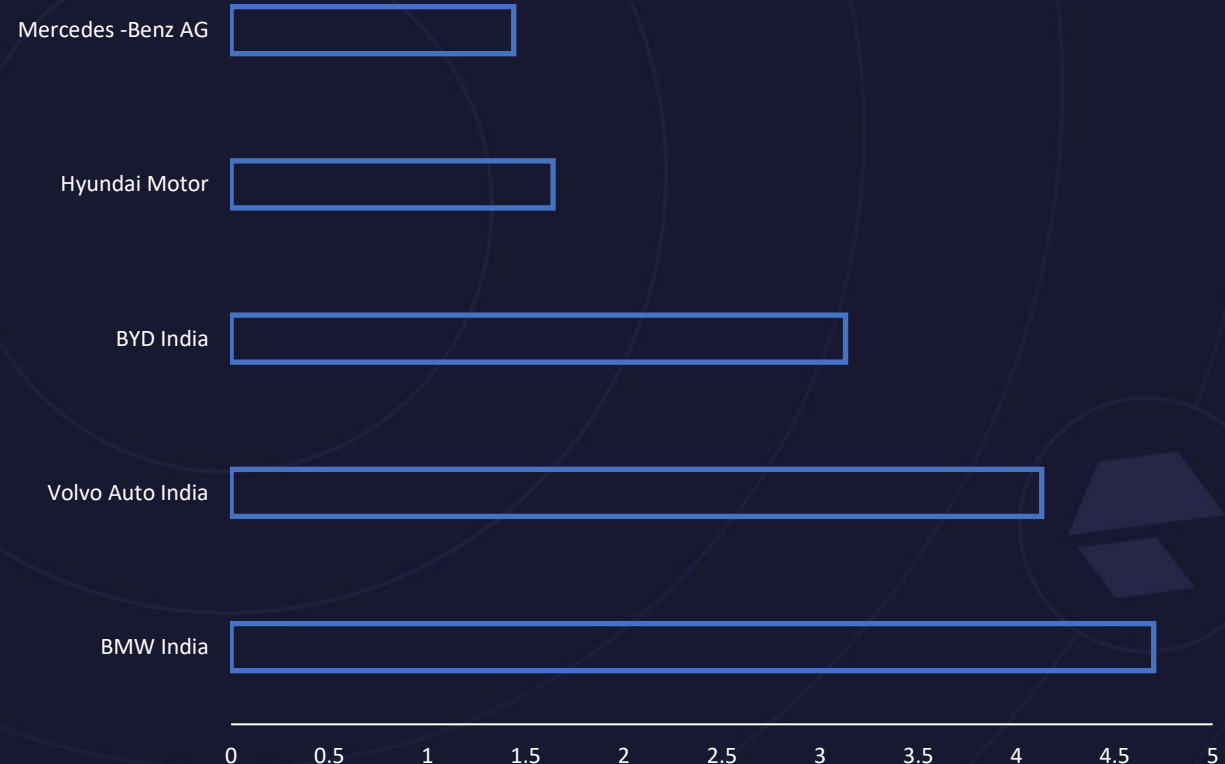
State	Vehicle_Category	Electric Vehicles Sold	Total Vehicles Sold	Pentration Rate	State	Vehicle_Category	Electric Vehicles Sold	Total Vehicles Sold	Pentration Rate
Delhi	2-Wheelers	38094	405218	9.4	Karnataka	2-Wheelers	148111	1279767	11.57
Delhi	4-Wheelers	8630	201130	4.29	Karnataka	4-Wheelers	12878	302221	4.26



List down the compounded annual growth rate (CAGR) in 4-wheeler units for the top 5 makers from 2022 to 2024



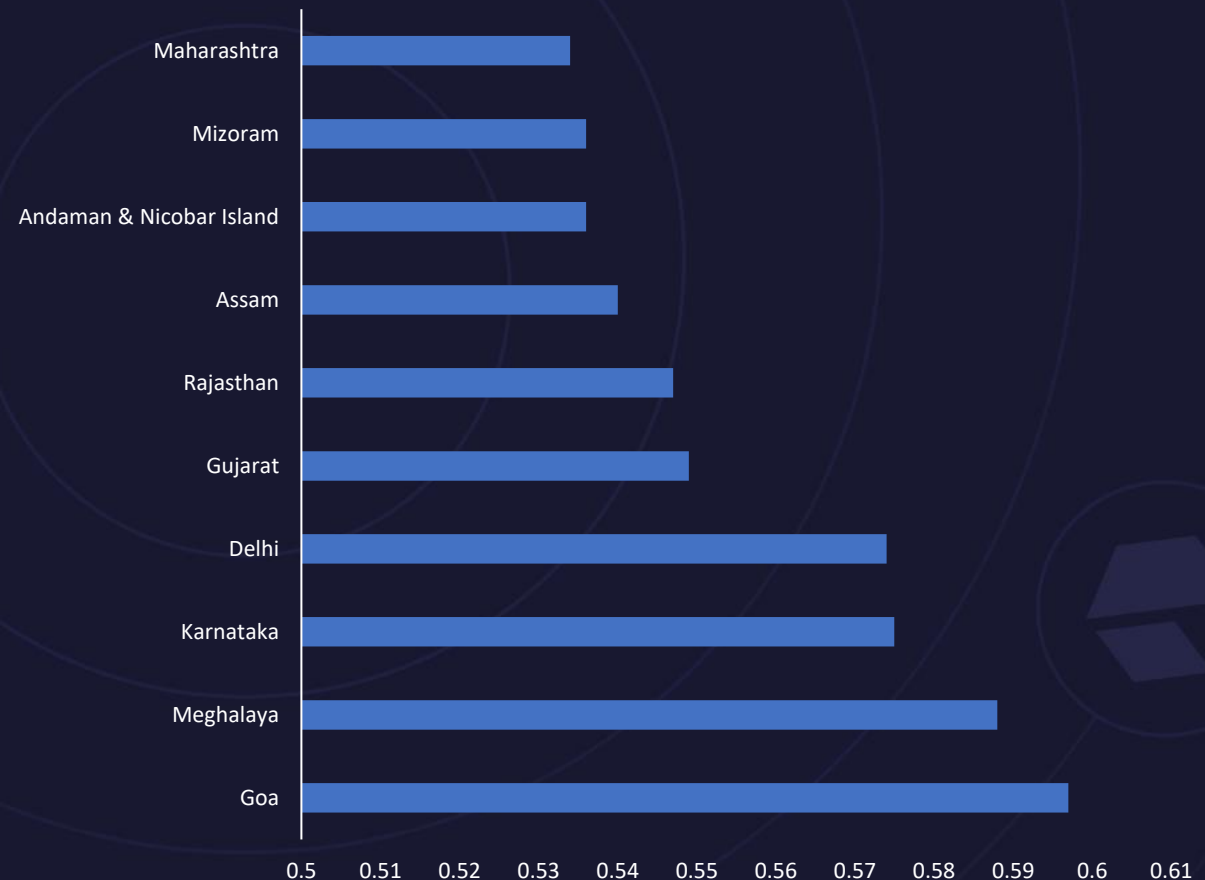
Maker	CAGR
BMW India	4.7
Volvo Auto India	4.13
BYD India	3.13
Hyundai Motor	1.64
Mercedes -Benz AG	1.44



List down the top 10 states that had the highest compounded annual growth rate (CAGR) from 2022 to 2024 in total vehicles sold



State	CAGR
Goa	0.597
Meghalaya	0.588
Karnataka	0.575
Delhi	0.574
Gujarat	0.549
Rajasthan	0.547
Assam	0.54
Andaman & Nicobar Island	0.536
Mizoram	0.536
Maharashtra	0.534



What are the peak and low season months for EV sales based on the data from 2022 to 2024



Month	Sales
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3	291587
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Month	Sales
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3	291587
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11	205196
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11	205196
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2	198049
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2	198049
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Months where sales are peak

Month	Sales
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6	106709
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Month	Sales
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6	106709
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7	127426
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7	127426
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4	134657
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4	134657
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Months where sales are low

What is the projected number of EV sales (including 2-wheelers and 4-wheelers) for the top 10 states by penetration rate in 2030, based on the compounded annual growth rate (CAGR) from previous years



State	CAGR	Penetration Rate	Growth By 2030
Goa	1.88	9.84	11.1
Kerala	1.76	6.64	7.01
Karnataka	1.39	7.84	6.54
Maharashtra	1.52	6.49	5.92
Delhi	1.28	6.76	5.19
Chandigarh	2.07	4.04	5.02
Chhattisgarh	1.97	4.03	4.76
Gujarat	1.76	4.4	4.65
Odisha	1.53	4.63	4.25
Rajasthan	1.42	4.55	3.88



Estimate the revenue growth rate of 4-wheeler and 2-wheelers EVs in India for 2022 vs 2024. Assuming an average unit price of

2- Wheeler ₹ 85,000.00 4- Wheeler ₹ 1,500,000.00

Year	Vehicle Category	Quarter	Sales	Year	Vehicle Category	Quarter	Sales	Revenue Growth
2021	2-Wheelers	Q1	986000000	2023	2-Wheelers	Q1	18531020000	5.32
2021	2-Wheelers	Q2	4144430000	2023	2-Wheelers	Q2	15334765000	27.03
2021	2-Wheelers	Q3	6117705000	2023	2-Wheelers	Q3	20515600000	29.82
2021	4-Wheelers	Q1	2551500000	2023	4-Wheelers	Q1	32151000000	7.94
2021	4-Wheelers	Q2	5310000000	2023	4-Wheelers	Q2	30345000000	17.5
2021	4-Wheelers	Q3	8425500000	2023	4-Wheelers	Q3	32164500000	26.2
2022	2-Wheelers	Q4	10220570000	2024	2-Wheelers	Q4	24897435000	41.05
2022	4-Wheelers	Q4	11578500000	2024	4-Wheelers	Q4	35691000000	32.44

Estimate the revenue growth rate of 4-wheeler and 2-wheelers EVs in India for 2023 vs 2024. Assuming an average unit price of

2- Wheeler ₹ 85,000.00

4- Wheeler ₹ 1,500,000.00



Year	Vehicle Category	Quarter	Sales	Year	Vehicle Category	Quarter	Sales	Revenue Growth
2022	2-Wheelers	Q1	11905950000	2023	2-Wheelers	Q1	18531020000	64.25
2022	2-Wheelers	Q2	12929520000	2023	2-Wheelers	Q2	15334765000	84.32
2022	2-Wheelers	Q3	18586610000	2023	2-Wheelers	Q3	20515600000	90.6
2022	4-Wheelers	Q1	12627000000	2023	4-Wheelers	Q1	32151000000	39.27
2022	4-Wheelers	Q2	15465000000	2023	4-Wheelers	Q2	30345000000	50.96
2022	4-Wheelers	Q3	17584500000	2023	4-Wheelers	Q3	32164500000	54.67
2023	2-Wheelers	Q4	18449675000	2024	2-Wheelers	Q4	24897435000	74.1
2023	4-Wheelers	Q4	25521000000	2024	4-Wheelers	Q4	35691000000	71.51