



STATISTICS COMMITTEE

Sixty-seventh Meeting

Lisbon, Portugal

Monday 23 September 2024

9.00 to 12.00

ACCURACY OF FORECASTS REPORT

Introduction

The International Nickel Study Group has produced forecasts for nickel mine, primary nickel production and usage (consumption) for many years.

This is an analysis of the accuracy of the forecasts compared with the actual figures for the years 2014 to 2023.

This analysis was requested by the IAP and prepared for the first time for the October 2007 Statistics Committee meeting. This is the 18th report.

The degree of accuracy of the projections produced by the Study Group is dependent primarily on the accuracy of the twice-yearly forecasts received from each Study Group member country. Member countries are therefore requested to take note of the trends shown in this report and, where differences have been identified, to use the relevant information to try to improve future results. This applies particularly to cases where the same error of over or underestimation has been consistent over a long period.

Due to the COVID-19 pandemic, the Spring 2020 meetings were cancelled and the secretariat did not receive sufficient information to be able to compile meaningful forecasts. For the years 2020, 2021 and 2022, the pandemic also influenced the extent of the deviations between actual and preliminary figures, in particular regarding metal usage.

Comparison

The Study Group makes preliminary forecasts at its meetings each October for the following calendar year, and then revised forecasts at its meetings each April for that current full calendar year.

The analysis covers nickel mine production, primary nickel production and nickel usage for a 10-year period from 2014 to 2023, the latest complete year available. Only the totals for each year have been compared. All data has been taken from official INSG documentation and is available on request.

The analysis commences with the world figures for mining, then primary production and, finally, primary usage by year. Forecasts for Asia, the Americas and Europe are also analyzed separately.

1. TOTAL WORLD ANALYSIS

1.1. Nickel Mine Production – World

October forecast (preliminary) for following calendar year:

The nickel mine production forecast was overstated 6 times and understated 4 times. In 2023 the variation was +0.9%.

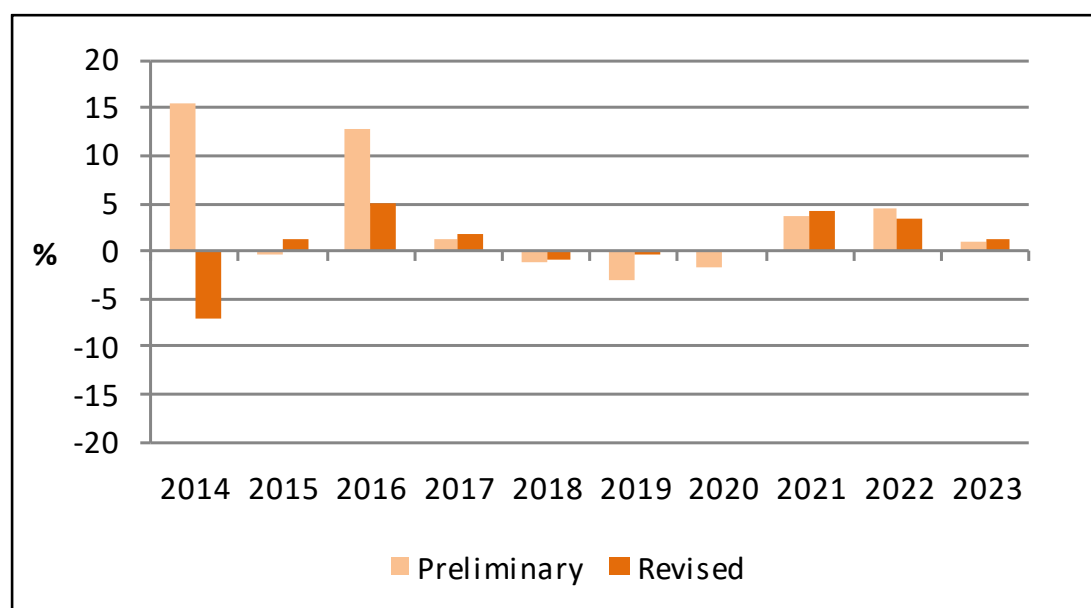
April forecast (revised) for that calendar year:

The nickel mine production forecast was overstated 6 times and understated 3 times – the Revised 2020 (April) was not prepared due to the COVID-19 pandemic. In 2023 the variation was +1.2%.

Table 1.1 – Nickel Mine Production – World – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	2504.0	2015.6	2171.2	332.8	+15.3	-155.6	-7.2
2015	2130.5	2169.2	2140.6	-10.1	-0.5	28.6	+1.3
2016	2243.2	2092.8	1990.7	252.5	+12.7	102.1	+5.1
2017	2157.3	2167.0	2128.1	29.2	+1.4	38.9	+1.8
2018	2286.1	2295.8	2314.4	-28.3	-1.2	-18.6	-0.8
2019	2444.6	2514.0	2518.4	-73.8	-2.9	-4.4	-0.2
2020	2392.6	n.a.	2432.9	-40.3	-1.7	n.a.	n.a.
2021	2803.9	2823.5	2707.7	96.2	+3.6	115.8	+4.3
2022	3353.4	3317.3	3209.0	144.4	+4.5	108.3	+3.4
2023	3710.2	3721.6	3677.4	32.8	+0.9	44.2	+1.2

Graph 1.1 – Nickel Mine Production – World – 2014 to 2023 – Forecasts vs. Actual



1.2. Primary Nickel Production – World

October forecast (preliminary) for following calendar year:

The primary nickel production forecast was overstated and understated 5 times each. In 2023 the variation was +0.9%.

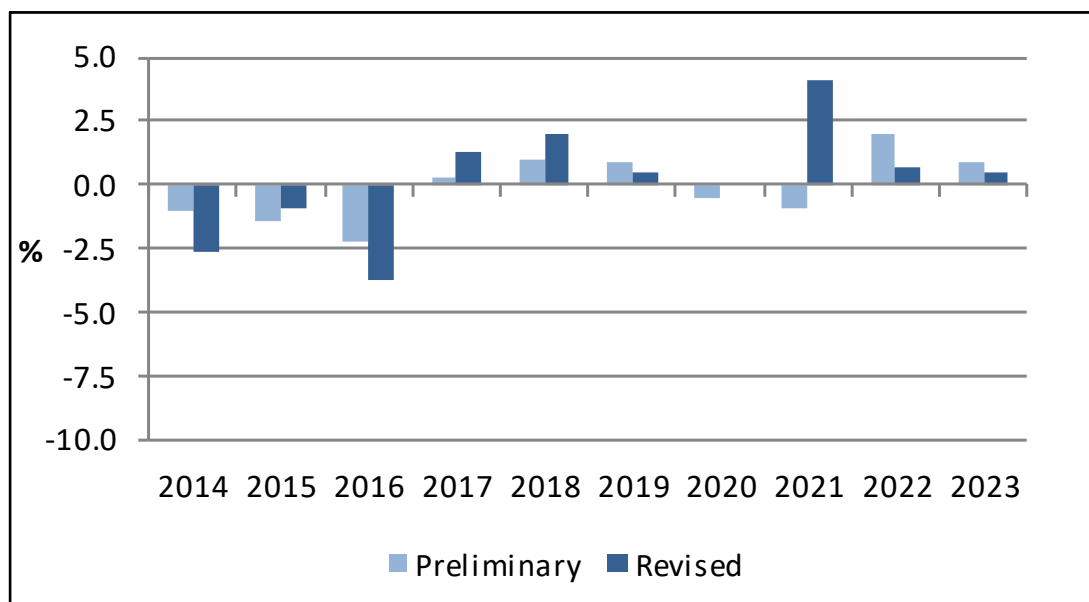
April forecast (revised) for that calendar year:

The primary nickel production forecast was overstated 6 times and understated 3 times – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was +0.5%.

Table 1.2 – Primary Nickel Production – World – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	1967.4	1936.1	1988.5	-21.1	-1.1	-52.4	-2.6
2015	1947.6	1958.1	1976.5	-28.9	-1.5	-18.4	-0.9
2016	1942.2	1913.3	1987.1	-44.9	-2.3	-73.8	-3.7
2017	2047.4	2067.1	2041.9	5.5	+0.3	25.2	+1.2
2018	2205.9	2227.1	2183.8	22.1	+1.0	43.3	+2.0
2019	2388.6	2380.3	2368.1	20.5	+0.9	12.2	+0.5
2020	2475.7	n.a.	2487.8	-12.1	-0.5	n.a.	n.a.
2021	2586.0	2717.7	2610.9	-24.9	-1.0	106.8	+4.1
2022	3120.2	3081.7	3060.6	59.6	+1.9	21.1	+0.7
2023	3386.5	3373.7	3357.1	29.4	+0.9	16.6	+0.5

Graph 1.2 – Primary Nickel Production – World – 2014 to 2023 – Forecasts vs. Actual



1.3. Primary Nickel Usage – World

October forecast (preliminary) for following calendar year:

The primary nickel usage forecast was overstated and understated 5 times each. In 2021, usage was negatively impacted in all regions by COVID-19 related lockdowns. In 2023 the variation was +0.7%.

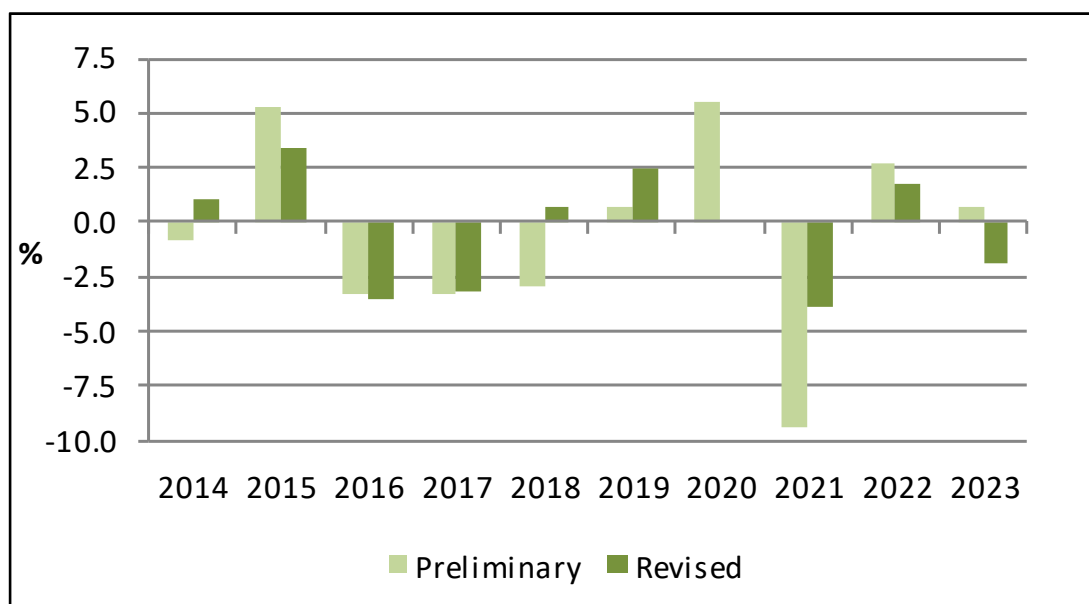
April forecast (revised) for that calendar year:

Primary nickel usage forecast was overstated 5 times and understated 4 times – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was -1.8%.

Table 1.3 – Primary Nickel Usage – World – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	1853.4	1888.8	1868.0	-14.6	-0.8	20.8	+1.1
2015	1973.8	1938.5	1875.7	98.1	+5.2	62.8	+3.3
2016	1965.0	1962.1	2032.7	-67.7	-3.3	-70.6	-3.5
2017	2113.0	2113.8	2183.5	-70.5	-3.2	-69.7	-3.2
2018	2258.9	2344.4	2327.4	-68.5	-2.9	17.0	+0.7
2019	2421.9	2463.8	2405.1	16.8	+0.7	58.7	+2.4
2020	2522.2	n.a.	2390.6	131.7	+5.5	n.a.	n.a.
2021	2517.6	2672.9	2779.6	-262.0	-9.4	-106.7	-3.8
2022	3044.1	3014.5	2962.6	81.6	+2.8	52.0	+1.8
2023	3215.5	3134.4	3192.6	22.9	+0.7	-58.2	-1.8

Graph 1.3 – Primary Nickel Usage – World – 2014 to 2023 – Forecasts vs. Actual



2. ASIA ANALYSIS

Since 2007 China P.R. and Kazakhstan have been included.

2.1. Nickel Mine Production – Asia

October forecast (preliminary) for following calendar year:

The nickel mine production forecast was overstated twice and understated 8 times. In 2023 the variation was -2.0%.

In the period of 2018 to 2021, Indonesia was revised up, due to faster than expected nickel pig iron production ramp up.

April forecast (revised) for that calendar year:

The nickel mine production forecast was overstated 3 times and understated 6 times – the Revised 2020 (April) was not prepared due to the COVID-19 pandemic. In 2023 the variation was -0.4%.

Table 2.1 – Nickel Mine Production – Asia – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	1052.0	629.0	750.4	301.6	+40.2	-121.4	-16.2
2015	654.0	675.5	734.1	-80.1	-10.9	-58.6	-8.0
2016	713.0	741.0	677.7	35.3	+5.2	63.3	+9.3
2017	818.5	819.7	825.9	-7.4	-0.9	-6.2	-0.7
2018	906.4	957.0	1084.6	-178.2	-16.4	-127.6	-11.8
2019	1118.0	1228.0	1305.8	-187.8	-14.4	-77.8	-6.0
2020	1072.0	n.a.	1242.2	-170.2	-13.7	n.a.	n.a.
2021	1460.0	1596.6	1588.9	-128.9	-8.1	7.7	+0.5
2022	2019.6	2111.6	2072.8	-53.2	-2.6	38.8	+1.9
2023	2507.0	2549.6	2559.4	-52.4	-2.0	-9.8	-0.4

2.2. Primary Nickel Production – Asia

October forecast (preliminary) for following calendar year:

The primary nickel production forecast was always understated. In 2023 the variation was -1.7%.

April forecast (revised) for that calendar year:

The primary nickel production forecast was overstated once and understated 8 times – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was -1.3%.

Table 2.2 – Primary Nickel Production – Asia – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	843.3	859.7	934.2	-90.9	-9.7	-74.5	-8.0
2015	847.0	879.5	896.6	-49.6	-5.5	-17.1	-1.9
2016	877.5	885.0	949.5	-72.0	-7.6	-64.5	-6.8
2017	1010.6	1031.1	1061.6	-51.0	-4.8	-30.5	-2.9
2018	1196.3	1224.5	1230.4	-34.1	-2.8	-5.9	-0.5
2019	1339.5	1387.1	1441.6	-102.1	-7.1	-54.5	-3.8
2020	1464.3	n.a.	1619.9	-155.6	-9.6	n.a.	n.a.
2021	1662.8	1830.2	1798.0	-135.2	-7.5	32.2	+1.8
2022	2168.0	2184.8	2216.0	-48.0	-2.2	-31.2	-1.4
2023	2549.5	2558.1	2593.0	-43.5	-1.7	-34.9	-1.3

2.3. Primary Nickel Usage – Asia

October forecast (preliminary) for following calendar year:

The primary nickel usage forecast was overstated and understated 5 times each. In 2023 the variation was +0.9%.

April forecast (revised) for that calendar year:

The primary nickel usage forecast was overstated 4 times and understated 5 times – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was -2.7%.

Table 2.3 – Primary Nickel Usage – Asia – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	1314.2	1341.4	1309.3	4.9	+0.4	32.1	+2.5
2015	1389.9	1367.3	1341.5	48.4	+3.6	25.8	+1.9
2016	1392.6	1408.1	1482.1	-89.5	-6.0	-74.0	-5.0
2017	1548.7	1551.1	1634.3	-85.6	-5.2	-83.2	-5.1
2018	1689.4	1777.4	1787.3	-97.9	-5.5	-9.9	-0.6
2019	1859.4	1919.1	1899.0	-39.6	-2.1	20.1	+1.1
2020	2005.0	n.a.	1960.7	44.3	+2.3	n.a.	n.a.
2021	2073.7	2214.8	2317.9	-244.2	-10.5	-103.1	-4.4
2022	2555.9	2537.2	2511.7	44.3	+1.8	25.6	+1.0
2023	2776.0	2678.0	2752.6	23.4	+0.9	-74.6	-2.7

3. THE AMERICAS (NORTH, CENTRAL & SOUTH AMERICA) ANALYSIS

Since 2006 Cuba has been included.

3.1. Nickel Mine Production – The Americas

October forecast (preliminary) for following calendar year:

The nickel mine production forecast was overstated 8 times and understated twice. In 2023 the variation was +23.8%.

April forecast (revised) for that calendar year:

The nickel mine production forecast was overstated 8 times and understated once – the Revised 2020 (April) was not prepared due to the COVID-19 pandemic. In 2023 the variation was +11.4%.

Table 3.1 – Nickel Mine Production – The Americas – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	500.0	492.7	514.2	-14.2	-2.8	-21.5	-4.2
2015	498.0	549.0	507.3	-9.3	-1.8	41.7	+8.2
2016	567.0	488.5	486.9	80.1	+16.5	1.6	+0.3
2017	504.4	502.6	469.8	34.6	+7.4	32.8	+7.0
2018	502.2	487.3	422.4	79.8	+18.9	64.9	+15.4
2019	456.0	445.0	416.4	39.6	+9.5	28.6	+6.9
2020	452.3	n.a.	407.3	45.0	+11.1	n.a.	n.a.
2021	469.0	443.6	393.4	75.6	+19.2	50.2	+12.8
2022	466.2	423.5	364.8	101.4	+27.8	58.7	+16.1
2023	408.1	367.1	329.6	78.5	+23.8	37.5	+11.4

3.2. Primary Nickel Production – The Americas

October forecast (preliminary) for following calendar year:

The primary nickel production forecast was overstated 8 times and understated twice. In 2023 the variation was +8.1%.

April forecast (revised) for that calendar year:

The primary nickel production forecast was overstated 6 times and understated 3 times – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was +7.9%.

Table 3.2 – Primary Nickel Production – The Americas – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	312.0	276.2	294.1	17.9	+6.1	-17.9	-6.1
2015	274.2	290.6	303.2	-29.0	-9.6	-12.6	-4.2
2016	306.0	308.0	306.0	0.0	-0.0	2.0	+0.7
2017	309.4	303.6	307.0	2.4	+0.8	-3.4	-1.1
2018	296.5	299.1	292.4	4.1	+1.4	6.7	+2.3
2019	319.1	292.1	280.4	38.7	+13.8	11.7	+4.2
2020	298.4	n.a.	271.4	27.0	+10.0	n.a.	n.a.
2021	288.5	302.6	264.3	24.2	+9.2	38.3	+14.5
2022	298.0	289.3	287.3	10.7	+3.7	2.0	+0.7
2023	256.4	255.9	237.2	19.2	+8.1	18.7	+7.9

3.3. Primary Nickel Usage – The Americas**October forecast (preliminary) for following calendar year:**

The primary nickel usage forecast was overstated 7 times and understated 3 times. In 2023 the variation was -4.3%.

April forecast (revised) for that calendar year:

The primary nickel usage forecast was overstated 7 times and understated twice – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was -3.1%.

Table 3.3 – Primary Nickel Usage – The Americas – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	178.6	180.2	179.6	-1.0	-0.5	0.6	+0.4
2015	188.1	187.1	172.0	16.1	+9.4	15.1	+8.8
2016	192.4	178.9	179.4	13.0	+7.2	-0.5	-0.3
2017	178.3	179.8	173.5	4.8	+2.8	6.3	+3.6
2018	186.1	184.4	171.8	14.3	+8.3	12.6	+7.3
2019	181.5	175.3	161.6	19.9	+12.3	13.7	+8.5
2020	170.3	n.a.	137.4	33.0	+24.0	n.a.	n.a.
2021	129.8	146.0	139.4	-9.5	-6.9	6.7	+4.8
2022	156.1	151.0	144.2	11.9	+8.3	6.8	+4.7
2023	140.4	142.2	146.7	-6.3	-4.3	-4.5	-3.1

4. EUROPE ANALYSIS

Since 2007 Russian Federation and Ukraine have been included. Since 2021 Cyprus has been included.

4.1. Nickel Mine Production – Europe

October forecast (preliminary) for following calendar year:

The nickel mine production forecast was overstated 8 times and understated twice. In 2023 the variation was +0.2%.

April forecast (revised) for that calendar year:

The nickel mine production forecast was overstated 7 times and understated twice – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was +1.3%.

Table 4.1– Nickel Mine Production – Europe – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	359.2	342.4	324.8	34.4	+10.6	17.6	+5.4
2015	354.2	313.3	310.6	43.6	+14.0	2.7	+0.9
2016	279.4	274.5	272.2	7.2	+2.7	2.3	+0.9
2017	246.1	235.0	288.2	-42.1	-14.6	-53.2	-18.5
2018	284.5	294.6	286.7	-2.2	-0.8	7.9	+2.8
2020	305.6	301.6	284.8	20.8	+7.3	16.8	+5.9
2019	302.6	n.a.	296.6	6.0	+2.0	n.a.	n.a.
2021	294.5	258.4	248.5	46.0	+18.5	9.9	+4.0
2022	283.7	258.8	269.0	14.7	+5.5	-10.2	-3.8
2023	255.7	258.4	255.2	0.5	+0.2	3.2	+1.3

4.2. Primary Nickel Production – Europe

October forecast (preliminary) for following calendar year:

The primary nickel production forecast was always overstated. In 2023 the variation was +7.8%.

April forecast (revised) for that calendar year:

The primary nickel production forecast was overstated 6 times and understated 3 times – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was +4.7%.

Table 4.2 – Primary Nickel Production – Europe – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	493.6	484.0	484.3	9.3	+1.9	-0.3	-0.1
2015	493.0	471.9	477.3	15.7	+3.3	-5.4	-1.1
2016	445.7	431.3	435.4	10.3	+2.4	-4.1	-0.9
2017	414.9	404.6	388.0	26.9	+6.9	16.6	+4.3
2018	405.9	403.0	390.5	15.4	+3.9	12.5	+3.2
2019	417.3	415.1	399.4	17.9	+4.5	15.7	+3.9
2020	419.8	n.a.	395.1	24.7	+6.2	n.a.	n.a.
2021	397.2	358.4	348.8	48.4	+13.9	9.6	+2.8
2022	404.2	369.1	348.1	56.1	+16.1	21.0	+6.0
2023	347.6	337.6	322.5	25.1	+7.8	15.1	+4.7

4.3. Primary Nickel Usage – Europe**October forecast (preliminary) for following calendar year:**

The primary nickel usage forecast was overstated 8 times and understated twice. In 2023 the variation was +1.1%.

April forecast (revised) for that calendar year:

The primary nickel usage forecast was overstated 7 times and understated twice – the Revised 2020 (April) forecast was not prepared due to the COVID-19 pandemic. In 2023 the variation was +7.4%.

Table 4.3 – Primary Nickel Usage – Europe – 2014 to 2023

	Forecast		Actual	Variation - Forecast: Actual			
	Preliminary	Revised		Preliminary		Revised	
	1,000 mt			1,000 mt	%	1,000 mt	%
2014	332.1	337.7	355.8	-23.7	-6.7	-18.1	-5.1
2015	367.3	357.6	335.9	31.4	+9.3	21.7	+6.5
2016	353.4	346.9	340.3	13.1	+3.9	6.6	+1.9
2017	354.8	351.5	345.0	9.8	+2.8	6.5	+1.9
2018	350.7	350.5	342.5	8.2	+2.4	8.0	+2.3
2019	352.8	344.2	324.8	28.0	+8.6	19.4	+6.0
2020	324.7	n.a.	278.6	46.1	+16.5	n.a.	n.a.
2021	297.5	296.7	309.7	-12.2	-3.9	-13.0	-4.2
2022	313.7	313.7	293.5	20.2	+6.9	20.2	+6.9
2023	286.0	303.7	282.8	3.2	+1.1	20.9	+7.4