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(Part- II : Metals & Alloys)

61st Edition

NICKEL

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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12 Nickel

Nickel is a lustrous, silvery-white metal. It is the fifth most common element of earth's crust. Nickel does not occur in native state. Pure nickel is obtained by reduction of its oxides or by the Mond process which consists of the formation of volatile nickel carbonyl produced by passing carbon monoxide over heated nickel oxide, and the dissociation of this compound at a higher temperature into nickel and carbon monoxide, which can be used again. It has a melting point of 1,453 °C, relatively low thermal & electrical conductivities, high resistance to corrosion & oxidation, excellent strength & toughness at high temperatures and capable of getting magnetised. It is attractive and very durable as a pure metal and alloys readily with other metals.

Nickel is not produced from primary sources in the country and the entire demand is met through imports. However, aided by latest technology HCL is carrying out recovery of nickel, copper and sulphuric acid from the spent electrolyte (waste stream) of ICC refinery at Ghatsila, Jharkhand.

OCCURRENCES AND RESERVES & RESOURCES

Nickel occurs principally as oxides, sulphides and silicates in India. Important occurrence is nickeliferous limonite in the overburden of chromite in Sukinda Valley, Jajpur district, Odisha. In addition, nickel is found associated with uranium deposits at Jaduguda, Jharkhand and a process is being developed for its recovery. Resources are spread over in Singhbhum East district of Jharkhand and Jajpur, Keonjhar & Mayurbhanj districts of Odisha.

As per NMI database as on 1.4.2020, based on UNFC, Resources of nickel are estimated at 189 million tonnes. The entire resources fall under Remaining Resources category. The State of Odisha is endowed with the largest share of resources of nickel ore in the country at 175 million tonnes (93%) followed by Jharkhand and Nagaland. These resources are mainly found to occur in three districts, namely, Jajpur (140 million tonnes), Mayurbhanj (27 million tonnes) and Keonjhar (8 million tonnes). Jharkhand has 9 million tonnes (5%) resources most of which are in Singhbhum (East) district. Nagaland has 5 million tonnes (3%) resources which predominantly are in Kiphire district (Table- 1).

EXPLORATION & DEVELOPMENT

The exploration and development details, if any, are covered in the Review on "Exploration & Development" under "General Reviews".

Table –1: Reserves/Resources of Nickel Ore as on 1.4.2020 (P)
(By Grades/States)

(In million tonnes)

Grades/States	Total Reserves (A)	Remaining Resources						Total Resources (A+B)
		Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Total (B)	
		STD221	STD222					
All India : Total	–	**21**	**21**	**31**	**53**	**63**	**189**	**189**
By Grades								
+ 0.9% Ni	–	13	7	–	18	3	42	42
0.5 to 0.9% Ni	–	7	13	31	21	21	94	94
(+) 0.5% Ni, unclassified	–	–	–	–	14	39	53	53
Not-known	–	–	–	–	–	0.23	0.23	0.23
By States								
Jharkhand	–	–	–	–	2	7	9	9
Karnataka	–	–	–	–	–	0.23	0.23	0.23
Nagaland	–	–	–	–	–	5	5	5
Odisha	–	21	21	31	51	51	175	175

Figures rounded off

INDUSTRY

HCL produced nickel sulphate as a by-product at its Ghatsila Copper Smelter in Jharkhand. The sulphide copper ore from Ghatsila area contains nickel in small quantity along with other important metals like gold and cobalt. HCL, by means of imported EMEW technology from Canada, developed capabilities to recover LME-Nickel, a grade cathode from lower concentration of copper in spent electrolyte, which otherwise was not possible by conventional means. Besides this, the technology also enabled HCL to recover nickel from the spent electrolyte at ICC refinery. Another technology of Acid Purification Unit (APU) again imported from Canada, which is an eco-friendly technology that allowed reduction of liquid effluent and facilitates recovery of nickel in the downstream process. HCL has installed capacity of 390 MT to recover nickel sulphate. However, production of nickel sulphate has not been reported since 2004-05. The Nicomet Industries Ltd located at Goa is presently engaged in production of nickel metal and their derivatives and its annual production capacity from its Goa plant is about 5,400 MTPA.

RESEARCH & DEVELOPMENT

India's first facility to produce nickel, a metal for which the country is completely dependent on imports, has been launched by the Hindustan Copper Limited (HCL) at its Indian Copper Complex (ICC) at Ghatsila in Jharkhand. The new facility "Nickel, Copper and Acid Recovery Plant" is the first facility in India to produce nickel metal of London Metal Exchange (LME) grade from primary resource.

NMDC has submitted application to DMG, Govt of Odisha for proposal to reserve 8 sq. km area in Jajpur district, Odisha, under Section 17 A (2A) of MM(D&R) Amendment Act, 2015 for prospecting and mining operation of Nickel.

CSIR NML has developed CSIRS first complete and holishic T RL- 4 Process for Extraction and Seperation of Nickel and other metals from spent lithium batterirs of mixed origion.

Considering the need and significance of the problem related to energy materials, CSRI-IMMT has carried out study synthesis of nickel-based alloys by pyrometallurgical recycling of spent Nickel-Metal hydride (Ni-MH) batteries. Key finding of the study was (a) The recovered nickel and cobalt in the form of alloys (99% pare) could be reused in battery industry.(b) also, 25% the nickel requirment in steel making is met from secondary sources, so this alloy can fulfill some of the requirement.

USES

Sectoral uses of nickel metal are in the areas of stainless steel making; catalysis chemical industries, as an electroplating material; heat resistant alloys; alloying element for non-ferrous metals; space, defence & rocket industries; and nickel cadmium batteries. Nickel is used in many specific and recognisable industrial and consumer products including stainless steel, alnico magnets, coinage, for filters & binders, rechargeable batteries, foundry, electric guitar strings, microphone capsules and special alloys. It is also used for plating and as green tint in glass. Nickel is predominantly an alloy metal & its chief use is in the nickel steel & nickel cast iron of which there are many varieties. It is also widely used in many other alloys, such as, nickel bronze & brasses and alloys with copper, chromium, aluminium, lead, cobalt, silver & gold. It is used as catalyst which is key to several important reactions including the hydrogenation of vegetable oils, reforming of hydrocarbons and in the production of fertilizers, pesticides and fungicides.

Nickel sulphate is an important compound used commercially in the country in nickel plating, in dip baths for enamelling, in preparation of nickel compounds and as a catalytic nickel. Nickel based alloys, like stainless steel with higher nickel content are used for more demanding applications, such as, in gas turbines and some chemical plants.

CONSUMPTION

World over about 65% of nickel is used in the manufacturing of stainless steel and 20% in other steel and non-ferrous (including super alloys) components often used for highly specialised industrial, aerospace and military applications. About 9% is used in plating and 6% in other uses, including coins and a variety of nickel chemicals.

SUBSTITUTES

Aluminium, coated steels, plain chromium steels and plastics are the common substitutes that could

replace stainless steel to a limited extent in many construction and transportation applications. Low-nickel, duplex, or ultra-chromium stainless steels are being substituted for austenitic grades in construction. Nickel-free speciality steels are sometimes used in place of stainless steel within the power-generating, petrochemical and petroleum industries. Titanium alloys or speciality plastics are in use as materials that could substitute nickel metal or nickel-based alloys in applications to resist corrosion in highly corrosive chemical environments. Lithium ion batteries are replacing nickel-metal hydride batteries in many applications.

TRADE POLICY

As per Foreign Trade Policy, 2015-2020, imports of nickel ores & concentrates (Heading no. 2604) and Nickel waste & scrap (Heading no. 75030010) are allowed free. However, some forms of metal waste & scrap (ITC-HS Code No. 7503 0090) are restricted.

WORLD REVIEW

The world reserves of nickel are estimated at 100 million tonnes of metal content.

Table – 2: World Reserves of Nickel (By Principal Countries)

(In Metric tonnes of nickel content)

Country Name	Reserves
World: Total (rounded off)	**100000000**
Australia[a]	21000000
Indonesia	21000000
Brazil	16000000
Russia	7500000
New Caledonia[b]	7100000
Philippines	4800000
Canada	2200000
China	2100000
United States	[c]370000
Other countries	20000000

***Source**: USGS, Mineral Commodity Summaries,2023*

(a) For Australia, Joint Ore Reserve Committee - compliant reserves were 9.5million tonnes.
(b) Overseas territory of France. NA- Not Available
(c) Includes reserve data for three projects. An additional three domestic projects a have defined resources but have not yet defined reserves.

Indonesia & Australia (21% each), Brazil (16%), Russia (8%) and New caledonia (7%) are the major countries having reserves of Nickel. The identified land-based resources averaging approximately 0.5% nickel or more contain at least 300 million tonnes of nickel. About 60% of nickel reserves is in laterites and 40% in sulphide deposits. Extensive nickel resources are also found in manganese crusts and as nodules in the ocean floor (Table-2).

In 2021, world mine production of nickel increased considerably to 2.81 million tonnes as compared to 2.49 million tonnes of metal content in the previous year (Table-3). The chief producers of nickel in the world in 2021 were Indonesia (42%), Philippines (14%), Russia (7%), New Caledonia (6%), Canada & Australia (5% each), China (4%), etc. (Table-3).

Table – 3: World Mine Production of Nickel (By Principal Countries)

(In tonnes of metal content)

Country	2019	2020	2021
World: Total	**2673000**	**2492000**	**2813000**
Indonesia	1036200	816700	1173200
Philippines	323325	328372	386359
Russia	223200	237200	*190000
New Caledonia	208185	199475	186284
Australia	158751	169344	150876
Canada	180904	167243	133581
China	104674	104674	98602
Brazil	55700	77100	76000
Guatemala	36300	50300	64900
Other countries	345744	341351	353578

***Source**: BGS,World Mineral Production, 2017-21*

FOREIGN TRADE

Exports

Exports of nickel ores and concentrates were 20 tonnes in the current year. However, there were negligible tonnes exports of nickel ores & concentrates in the preceding year. On the other hand, exports of nickel and alloys including scrap increased drastically by 100% to 5893 tonnes in 2021-22 from 2937 tonnes in the previous year. Out of the total alloys and scrap exported in 2021-22, nickel & alloys were 4199 tonnes, while nickel waste & scrap were1694 tonnes. Exports of nickel and alloys including scrap were mainly to China (14%), UK (15%), Singapore (11%), Mexico (7%), and USA (9%), (Tables-4 to 18).

Imports

Imports of nickel ores & concentrates were 106 tonnes in the year 2021-22. Imports of nickel & alloys including scrap were at 51519 tonnes in 2021-22 which decreased by 9% from that of 56,536 tonnes in the previous year. Out of the total alloys and scrap imported in 2021-22, nickel & alloys were at 48,437 tonnes as compared to 53,248 tonnes in the previous year, while nickel waste & scrap were 3,082 tonnes as compared to 3,288 tonnes in the previous year. Imports of nickel and alloys including scrap in 2021-22 were mainly from Netherlands (11%), Norway (11% each), UAE (9%), and Japan (8%).(Tables-19 to 33).

Table – 4: Exports of Nickel Ores and Conc. (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**-**	**-**	**20**	**5183**
Brazil	-	-	**20**	5183

Figures rounded off

Table – 5: Exports of Nickel and Alloys Including Scrap (By Countries)

Country	2020-21 (R)		2021-22(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**2937**	**4147078**	**5893**	**9407073**
China	603	732297	799	1384723
Singapore	32	49511	626	1186321
U S A	161	382978	509	947716
U K	332	263743	882	861527
Mexico	193	330936	409	813651
Korea Rep.of	127	179750	358	535976
UAE	96	182322	284	495901
Saudi Arabia	45	134758	92	298523
Thailand	77	114149	245	296068
Turkey	187	308047	169	278385
Other countries	1084	1468587	1520	2308282

Figures rounded off

Table – 6: Exports of Nickel & Alloys
(By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**2269**	**3763280**	**4199**	**8103812**
China	603	732297	798	1382691
Singapore	32	49511	626	1186321
Mexico	193	330936	409	813651
U S A	159	381353	366	806372
Korea Rep. of	127	179750	358	535976
UAE	96	182322	284	495901
Saudi Arabia	45	134758	92	298523
Turkey	187	308047	169	278385
Brazil	98	152797	140	262843
Thailand	77	114149	127	217784
Other countries	652	1197360	830	1825365

Figures rounded off

Table – 7: Exports of Nickel Waste & Scrap
(By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**668**	**383798**	**1694**	**1303216**
UK	297	181612	798	682783
U S A	2	1625	143	141344
Sweden	177	104595	192	132285
Netherlands	55	24942	240	115486
Japan	41	24241	109	86268
Thailand	-	-	118	78284
Germany	17	5456	45	38519
Malaysia	60	34127	32	18031
Taiwan	-	-	5	4208
Belgium	15	4931	7	2729
Other countries	4	2269	5	3324

Figures rounded off

Table – 8 : Exports of Electroplated Anode of Nickel (By Countries)

Country	2021-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**64**	**31638**	**14**	**13359**
Saudi Arabia	7	4558	14	12421
Singapore	-	-	++	368
Israel	++	79	++	197
Maldives	-	-	++	150
U S A	++	1	++	123
Qatar	-	-	++	47
New Zealand	-	-	++	17
Japan	-	-	++	15
Bangladesh	++	2	++	13
U A E	1	648	++	5
Other countries	56	26350	++	3

Figures rounded off

Table – 9 : Exports of Nickel Oxide Sinters & Otr Intermediate (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**-++**	**127**	**++**	**83**
USA	++	28	++	62
Czech Republic	++	99	++	21

Figures rounded off

Table – 10 : Exports of Nickel Mattes (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**++**	**142**	**++**	**44**
Bangladesh	-	-	++	27
Bhutan	-	-	++	12
Nepal	-	-	++	5
Turkey	++	142	-	-

Figures rounded off

Table – 11 : Exports of Nickel Electroplated Anode (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	++	**3998**	++	**2307**
Bangladesh	-	-	++	1085
Qatar	-	-	++	1050
Netherlands	-	-	++	172
Kenya	++	1445	-	-
U K	++	1294	-	-
Nepal	++	600	-	-
Bulgaria	++	398	-	-
U S A	++	261	-	-

Figures rounded off

Table – 12 : Exports of Nickel : Worked (By Countries)

Country	2020-21 (R)		2021-22(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**253**	**370849**	**290**	**529209**
Brazil	39	58637	59	109678
Germany	10	13343	60	105130
Romania	-	-	56	101522
Philippines	21	31264	24	45562
Turkey	21	31273	19	33795
Colombia	6	9132	16	32315
U S A	6	8306	13	27194
Saudi Arabia	7	10519	15	23220
Mexico	-	-	13	21423
Italy	++	1079	7	11331
Other Countries	143	207296	8	18039

Figures rounded off

Table – 13 : Exports of Nickel & Alloys: Unwrought (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**3**	**6481**	**8**	**7365**
Nepal	++	626	4	2847
Germany	-	-	4	2583
Italy	-	-	++	497
Australia	++	30	++	489
Turkey	++	2466	++	199
Gabon	-	-	++	176
Bangladesh	-	-	++	129
Israel	-	-	++	104
U A E	-	-	++	91
Kenya	++	136	++	78
Other countries	3	3223	++	172

Figures rounded off

Table – 14 : Exports of Nickel & Alloys : Worked, Nes (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**157**	**608831**	**147**	**630701**
Hungary	20	64008	16	84573
Korea, Rep of	25	28772	52	75926
USA	15	58571	14	58462
Germany	17	58865	15	57605
Indonesia	7	33893	6	44971
Mexico	4	25692	2	30674
Thailand	4	20008	3	28828
Singapore	5	19388	7	25649
China	1	5820	2	19581
U A E	2	9159	2	18092
Other countries	57	284655	28	186340

Figures rounded off

Table – 15 : Exports of Nickel & Alloys: Worked (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**186**	**253186**	**282**	**499470**
Turkey	52	61574	95	132474
Saudi Arabia	10	32091	22	95362
USA	10	11639	47	81361
South Africa	12	15273	16	22325
Philippines	13	14136	8	21248
U K	2	2054	10	18323
Romania	++	152	11	17101
Brazil	6	6765	13	16932
U A E	2	5069	8	16453
Colombia	10	15091	11	14678
Other countries	69	89342	41	63213

Figures rounded off

Table – 16 : Exports of Bars,Rods,Plates,Sheets,Foils of Nickel Alloys (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**321**	**473082**	**353**	**722636**
Korea Rep.of	56	88230	57	108437
USA	30	52351	31	70222
France	13	22500	35	64478
Turkey	76	82100	29	64272
Thailand	15	22633	33	63283
Japan	11	20454	25	48936
Brazil	32	48231	25	48373
Mexico	7	10354	25	46615
Philippines	2	2731	20	40252
Saudi Arabia	2	10635	4	22010
Other countries	77	112863	69	145758

Figures rounded off

Table – 17 : Exports of Bars,Rods,Plates,Sheets,Foils of Nickel Alloys (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**1310**	**2001393**	**1730**	**3232817**
Mexico	182	294890	359	700463
USA	98	250041	261	569016
Korea Rep.of	46	62748	249	351496
China	602	725058	195	317345
UAE	72	137860	89	156800
Saudi Arabia	21	58502	48	145889
U K	26	52247	68	139594
Italy	8	16439	86	131287
Thailand	42	54655	87	119141
Brazil	21	38716	41	72371
Other countries	192	310237	247	529415

Figures rounded off

Table – 18 : Exports of Nickel Electroplated Anode (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**++**	**3998**	**++**	**2307**
Bangladesh	-	-	++	1085
Qatar	-	-	++	1050
Netherlands	++	-	++	172
Kenya	++	1445	-	-
U K	++	1294	-	-
Nepal	++	600	-	-
Bulgaria	++	398	-	-
U S A	++	261	-	-

Figures rounded off

Table –19: Imports of Nickel Ores & Conc.
(By Countries)

Country	2020-21(R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**37**	**6404**	**106**	**16165**
U S A	-	-	22	9783
Saudi Arabia	-	-	84	6382
Japan	14	3504	-	-
U A E	3	1634	-	-
Indonesia	20	1266	-	-

Figures rounded off

Table – 20: Imports of Nickel and Alloys Including Scrap
(By Countries)

Country	2020-21(R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**56536**	**55125443**	**51519**	**79427347**
Netherlands	1704	2032483	5965	9177044
Norway	5885	6935479	5766	8469753
U A E	1506	1201433	5247	6604258
Japan	5715	7387333	4066	6066640
South Africa	2923	3450761	4199	5890817
Russia	1249	1458302	3525	5348328
China	2775	3850114	2508	4331903
U K	1599	2718478	2354	4282779
U S A	2927	4302850	1813	4173314
Singapore	1497	1883577	1649	3589939
Other countries	28756	19904633	14427	21492572

Figures rounded off

Table – 21: Imports of Nickel & Alloys
(By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**53248**	**53022663**	**48437**	**77416339**
Netherlands	1620	1982477	5939	9164183
Norway	5861	6905374	5766	8469753
U A E	949	961851	4698	6229351
Japan	5514	7224603	4047	6061110
South Africa	2923	3450761	4199	5890817
Russia	1249	1458302	3525	5348328
China	2775	3850114	2508	4331903
U K	1558	2692889	2350	4279035
U S A	2349	3944331	1797	4159180
Singapore	1393	1834252	1380	3430644
Other countries	27057	18717709	12228	20052035

Figures rounded off

Table – 22: Imports of Electroplated Anode of Nickel (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**78724**	**40534144**	**96488**	**68600951**
Tanzania	11439	5562294	33749	24622075
South Africa	46821	24112578	32085	22462691
Mozambique	12601	5774332	23923	16304490
Philippines	7284	4764104	3706	3113963
Namibia	-	-	2545	1714810
Malaysia	255	144449	234	182036
U S A	212	121052	196	154242
China	58	18465	27	19822
UK	1	3166	2	9857
Singapore	3	1937	12	9553
Other countries	50	31767	9	7412

Figures rounded off

Table –23: Imports of Nickel Oxide Sinters & Other Intermediate (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**14098**	**2122865**	**362**	**745568**
Australia	-	-	12	460110
Singapore	-	-	120	191778
UAE	20	4059	211	61759
Netherlands	-	-	19	29051
China	++	7	++	1819
France	-	-	++	751
U S A	51	12063	++	300
Papua	13788	2054289	-	-
Indonesia	78	16402	-	-
Saudi Arabia	78	16318	-	-
Other countries	83	19722	-	-

Figures rounded off

Table –24: Import of Nickel Mattes (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	++	**407**	++	**293**
UK	++	396	++	249
USA	++	11	++	44

Figures rounded off

Table –25: Imports of Nickel Except Elecroplated Anode (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**27586**	**31317895**	**37248**	**54838895**
Netherlands	1362	1534814	5602	8650476
Norway	5861	6905365	5766	8469724
South Africa	2879	3406237	4199	5890587
U A E	540	635807	3600	5329686
Russia	1239	1368013	3507	5243210
Japan	3933	4546886	2918	4022005
Canada	2895	3149912	2139	2843415
France	295	309689	1633	2551454
Korea Rep.of	1255	1367722	1676	2446677
U K	800	979006	1606	2371668
Other countries	6563	7114444	4602	7019993

Figures rounded off

Table – 26: Imports of Nickel : Worked (By Countries)

Country	2020-21 (R)		2021-22(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**13**	**23174**	**14**	**23092**
Netherlands	-	-	14	20726
USA	++	175	++	1705
France	++	1316	++	263
China	7	11917	++	215
U K	3	3525	++	114
Taiwan	-	-	++	36
Germany	1	4006	++	33
Indonesia	-	-	++	++
Colombia	2	2170	-	-
Hong Kong	++	65	-	-
Other countries	-	-	-	-

Figures rounded off

Table – 27: Imports of Nickel & Alloys:Unwrought
(By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**1027**	**896439**	**343**	**484635**
UAE	175	59528	120	183549
Japan	10	8400	105	68581
Netherlands	71	80939	43	56511
Korea	100	115549	40	53203
U S A	327	157541	13	52107
U K	101	189316	6	25308
China	5	14930	7	17189
Slovenia	3	11352	6	14655
Germany	++	119	2	7549
Turkey	++	1952	1	4057
Other countries	235	256813	++	1926

Figures rounded off

Table – 28: Imports of Nickel & Alloys :Worked,Nes
(By Countries)

Country Name	2020-21 (R)		2021-22(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**368**	**2324709**	**457**	**3254660**
Singapore	4	296963	3	1264830
USA	29	270431	21	407650
China	120	214536	277	388538
Hong Kong	2	858714	1	305654
Japan	28	114782	31	211469
Germany	17	158720	12	201257
Korea Rep.of	69	136597	57	133492
UK	24	73537	16	102624
Mexico	4	22865	6	72181
Italy	6	26238	10	52787
Other countries	65	151326	23	114178

Figures rounded off

Table – 29: Imports of Nickel & Alloys :Worked (By Countries)

Country Name	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**3634**	**5138634**	**3696**	**6440725**
China	844	1353439	1040	1981064
Sweden	1109	807595	924	870063
U K	260	592537	377	862152
U S A	169	419682	210	602893
Germany	210	336399	284	482729
Taiwan	121	223227	208	377012
Japan	327	553483	178	343481
Italy	79	112395	158	248013
Brazil	210	343829	126	238998
Singapore	47	74395	73	152574
Other countries	258	321653	118	281746

Figures rounded off

Table – 30: Imports of Bars,Rods,Plates,Sheets,Foils of Nickel (By Countries)

Country Name	2020-21 (R)		2021-22(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**531**	**1118988**	**893**	**1865739**
U K	182	363272	178	410550
China	45	101769	159	386080
U S A	55	124592	137	279997
Netherlands	94	130554	147	243806
Singapore	4	37672	7	80345
U A E	2	11701	142	74761
Germany	47	92479	20	60215
Romania	-	-	18	56744
France	21	50484	22	54987
Korea Rep.of	4	11955	12	37894
Other countries	77	194510	51	180360

Figures rounded off

Table –31: Imports of Bars,Rods,Plates,Sheets,Foils of Nickel Alloys
(By Countries)

Country Name	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**5971**	**10049732**	**5424**	**9757301**
USA	1695	2931058	1410	2803923
Germany	830	1615107	759	1625030
Japan	1196	1978821	812	1407921
China	333	639491	476	658992
U A E	203	232136	622	563681
U K	188	491300	167	506332
France	186	443015	197	489642
Italy	161	318947	182	467031
Sweden	153	151049	105	156997
Malaysia	55	33894	145	145464
Other countries	971	1214914	549	932288

Figures rounded off

Table – 32: Imports of Nickel Electroplated Anode
(By Countries)

Country Name	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**20**	**29820**	**++**	**5431**
Canada	++	42	++	3149
USA	++	2046	++	1419
Singapore	++	1484	++	746
U A E	-	-	++	54
U K	-	-	++	38
Switzerland	-	-	++	17
Netherlands	-	-	++	7
France	++	153	++	1
Italy	20	21009	-	-
Germany	++	4709	-	-
Other countries	++	377	-	-

Figures rounded off

Table – 33: Imports of Nickel Waste & Scrap (By Countries)

Country Name	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**3288**	**2102780**	**3082**	**2011008**
Saudi Arabia	278	141539	1311	856954
UAE	557	239582	549	374907
Singapore	104	49325	269	159295
Bangladesh	113	93487	165	133804
Korea	99	40702	174	85565
Lebanon	-	-	80	67625
Kuwait	17	11346	64	44538
Malaysia	103	71658	36	38033
Qatar	206	79725	56	33291
Italy	99	45545	67	25551
Other countries	1712	1329871	311	191445

Figures rounded off

FUTURE OUTLOOK

Primarily World nickel demand is for the production of stainless steel where about 65% nickel is consumed. Nickel accounts for 10 to 20% input cost in stainless steel production depending on the nickel content. The future outlook for nickel depends mainly on the production of stainless steel which is one of the main drivers for nickel produced. Batteries and the ongoing Electric Vehicle revolution could prove to be a transformational event as NCA and NCM, one still predominantly used. However, Li-ion technology is gaining in popularity and increasingly by getting established as the battery of choice.

India will have no option but to depend on imports for this metal till a technology to recover nickel from the overburden of chromite ore in Odisha is established on a commercial scale.

The process developed by HCL for the production of primary nickel from waste generated during copper refining will be a breakthrough in the area of nickel production in the country.

India imports as well as exports nickel scrap covered by ISRI code, Aroma, Barly, Dandy, Daunt, Delta, Decov, Depth, Hitch, House, Ideal, Indian, Junto, Lemon, Lemur are covered under HS code 75030010. But there is hardly any data available or reported for recycling and recovery of nickel from scrap. The recycling of nickel-bearing scrap in Organised Sector will be another source for meeting the demand.