

**SUMMARY SHEET OF R&D PROJECTS AND DISBURSEMENT OF FUND**

Sl No	Title of the R&D project/ Purpose for which Grant released	Total cost of project	Govt. Funding Approved	Fund Released (in Rs. Lakh)													Total Fund released	Balance to be released		
				2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19			2019-20				
														Total	Capital	Revenue			Total	Capital
<b>A</b>	<b>Projects Pursued under Ministry of Steel's scheme: "Promotion of Research &amp; Development in Iron &amp; Steel Sector"</b>																			
1	Improvement in sinter productivity through deep beneficiation and agglomeration technologies for rational utilization of low grade iron ores and fines, <b>National Metallurgical Laboratory, (NML) Jamshedpur; IMMT, Bhubaneswar; IIT, Kanpur, RDCIS (Project Completed)</b>	1,255.80	1,255.80	161.50	257.90	493.80	342.60											1,255.80	0.00	
2	Alternate complementary Route of Iron/Steel making with reference to Indian raw material viz low grade iron ore and non coking coal, <b>National Metallurgical Laboratory, (NML) Jamshedpur; IMMT, Bhubaneswar; AMPRI, Bhopal; CIMFR, Dhanbad; RDCIS, Ranchi (Project Completed)</b>	858.00	858.00	133.00	371.60	232.80	120.60											858.00	0.00	
3	Production of low Phosphorus Steel using DRI through Induction furnace route adopting innovative fluxes and/or design (refractory) changes; <b>National Metallurgical Laboratory, (NML) Jamshedpur; NISST, Mandi Govindgarh (Project Completed)</b>	237.00	237.00	32.00	158.00	47.00	0.00											237.00	0.00	
4	Development of futuristic Technology for carbon free iron production using alternate reductants like hydrogen with minimum or no CO2 emission. Smelting reduction of iron ore/fines by hydrogen plasma and elimination of CO2 emission; <b>Institute of Minerals and Materials Technology, (IMMT) Bhubaneswar (Project Completed)</b>	990.35	990.35	87.00	513.00	167.00	100.00	123.35										990.35	0.00	
5	Beneficiation of Iron Ore slimes from Barsua and other mines in India by: <b>RDCIS (Project Discontinued)</b>	2,769.40	1,408.20		192.90	0.00	908.00											1,100.90	0.00	
6	Development of pilot scale pelletization technology for Indian Goethitic/hematite ore with varying degree of fineness by: <b>RDCIS, Ranchi; IMMT, NML, IIT Kharagpur (Project Completed)</b>	4,188.77	2,206.27		290.10	0.00	263.00	452.45										1,005.55	0.00	
7	CO2 abatement in Iron and Steel production by process optimisation by <b>Indian Institute of Technology, (IIT) Kharagpur (Project Completed)</b>	84.36	84.36		40.12	22.12	22.12											84.36	0.00	
8	Production of low ash (10% ash) coal (coking non coking) from high ash Indian coals including desulphurisation of high sulphur North East coal by: <b>Institute of Minerals and Materials Technology, (IMMT); Bhubaneswar; RDCIS, Ranchi; NML, Jamshedpur; CIMFR, Dhanbad; CMPDI, Ranchi; NEIST, Jorhat (Project Completed)</b>	1,943.53	1,688.53		731.00	0.00	733.33	224.20										1,688.53	0.00	
9	Production of low Phosphorus steel through Induction Furnace route using DRI as major ferruginous raw material – An Industrial Assessment: by <b>NML/ NISST (Project Completed)</b>	193.00	193.00						178.00	15.00								193.00	0.00	
10	Development of Automation System for Optimum Coal Blending at Coal Handling Plant of Coke Oven Batteries by RDCIS	1,290.00	645.00							218.00	120.00		147.00	138.50	8.50			485.00	0.00	
11	DPR of project on 'Development of Technology for Cold Rolled Grain Oriented Steel Sheets'	137.83	34.46						25.00		9.46							34.46	0.00	
12	Economic production of iron through direct reduction of Mill Scale by low grade coal of Rajasthan by MNIT Jaipur	540.00	166.00							141.00	25.00							166.00	0.00	
13	Develop Procedure for Joining Next Generation High Temperature Material to be used for Supercritical/ Ultra Supercritical Power Plant by Friction Stir Welding by Jadavpur University in association with MECON	567.26	558.26							481.10								481.10	77.16	
14	Development of Cost Effective Refractory Lining Materials for Induction Melting Furnace suitable for production of Quality Steel by CGCRI & NISST <b>(Project Completed)</b>	165.00	165.00							132.00		33.00						165.00	0.00	

15	Development of Dry Slag Granulation Technology and Energy Recovery System for Blast Furnace Slag for Producing Clinker Compatible Product by IIT Madras & JSW	168.74	84.37							39.02	15.92		29.43	7.43	22.00			84.37	0.00
16	Development of infrared camera based torpedo ladle car condition monitoring system by MECON (Project Completed)	308.00	154.00								134.50		19.50	0.00	19.50			154.00	0.00
17	Development of nickel free nitrogen austenitic stainless steel for biomedical applications by IIT BHU	284.45	284.45							228.00		28.06	0.00	28.06	28.39	0.00	28.39	284.45	0.00
18	Indigenous Development of Model based Breakout Prediction System (BOPS) for Continuous Casters by RDCIS	582.00	260.00							111.77	133.23							245.00	15.00
19	Development of Fluidised Bed Reduction Roasting Process for slimes & low grade iron ores by utilizing thermal grade coal for their magnetic susceptibility properties and maximizing the iron recovery by IIT Madras & JSW Steel	245.52	122.76							56.82		21.06	8.00	13.06	44.88	25.00	19.88	122.76	0.00
20	Production of low Carbon & low Phosphorus Ferromanganese by metallothermic treatment of high Manganese Slag using Silicomanganese by NML Jamshedpur.	150.00	150.00							116.00		34.00	0.00	34.00				150.00	0.00
21	Production of highly metallised Directly Reduced Iron from mill scale & lean grade coal in Tunnel Kiln by NML Jamshedpur. (Project Completed)	203.00	151.00							151.00								151.00	0.00
22	Reduction Roasting and Microwave Heating of some difficult to treat Ores for the production of Pellet Feed Concentrate by IMMT Bhubaneswar	124.80	124.80							78.00		30.00	10.00	20.00	16.80	0.00	16.80	124.80	0.00
23	Modeling & Optimization of High Concentration Iron Ore fines /concentrate slurry Pipelines for Indian Iron Ore Processing Industries by IMMT Bhubaneswar & NMDC Ltd.	425.00	212.50							113.70		64.50	43.50	21.00	34.30	0.00	34.30	212.50	0.00
24	Development of a cost effective green technology for Pre Reduction of Chromite Ore in Tunnel Kiln and Production of High Carbon Ferro Chrome in SAF by NISST, NML & MECPL	614.00	306.50								161.00	70.02		70.02	75.48	0.00	75.48	306.50	0.00
25	A Novel Approach of Making Green Belite Cement from Electric Arc Furnace Steel Making Slag by IIT Kharagpur	139.20	139.20								111.48	12.96		12.96	9.38		9.38	133.82	5.38
26	Amorphous Electrical Steel (AES) for Energy Application submitted by NML Jamshedpur	3,634.00	3,634.00								847.47	135.49	135.49		198.12		198.12	1,181.08	2,452.92
27	Development of Design Guidelines and Specifications for utilization of steel slag in road construction by CRRRI	626.36	286.50									286.50	286.50	0.00				286.50	0.00
28	Development of super alloy grade 625 & 825 for commercial market by MIDHANI	2,854.00	800.00									200.00	200.00	0.00	600.00	600.00	0.00	800.00	0.00
29	Optimisation of floatation process for Indian Coking Coal using advanced Pneufлот Floatation Cell by IMMT	91.54	91.54									74.74	40.00	34.74	16.80	0.00	16.80	91.54	0.00
30	Fundamental process engineering to minimize re-oxidation of steel during teeming via a ladle shroud leading to improved castability and cleanliness by IIT Kanpur	154.63	154.63									130.25	87.88	42.37	15.19	4.00	11.19	145.44	9.1900
31	Conversion of emitted CO <sub>2</sub> to chemical fuels by IMMT	77.05	77.05									49.45	30.00	19.45	14.95		14.95	64.40	12.65
32	Development of newer Cementitious Materials using Chemically Activated LD Slag by CBRI	195.00	195.00									120.00	85.00	35.00				120.00	75.00
33	Integrated cost effective technology for attaining Zero liquid discharge in steel plants with emphasis on slag utilization by CIMFR	23.24	23.24									12.12	5.00	7.12	11.12	6.00	5.12	23.24	0.00
34	Synthesis of Kudremukh Iron Ore Mine Tailings based Geopolymer Aggregate using Fly Ash as Precursor in Construction Industry by KIOCL	19.96	11.20									11.20	11.20					11.20	0.00
35	Waste Management of Generated Sludge from Indian Steel and Steel Related Plants: A Sustainable Business Model by BITS Pilani	38.05	38.05									23.72	11.50	12.22	6.77		6.77	30.4900	7.5560
36	Development of a cost effective refractory lining materials for induction melting furnace suitable for production of quality steel: phase-II (Industrial Trials)" by NISST, CGCRI & NML	309.00	269.00												209.00		209.00	209.00	60.00

37	Indigenous development of Austempered Ductile Iron technology for use in automobile & agricultural industries in India by PEC Chandigarh	189.00	149.00												120.00	95.00	25.00	120.00	29.00	
<b>Sub Total (A)</b>		<b>26,676.83</b>	<b>18,209.02</b>	<b>413.50</b>	<b>2,554.62</b>	<b>962.72</b>	<b>2,489.65</b>	<b>800.00</b>	<b>203.00</b>	<b>1,026.13</b>	<b>1,160.17</b>	<b>1,286.18</b>	<b>1,500.00</b>	1,100.00	400.00	<b>1,401.18</b>	730.00	671.18	<b>13,797.15</b>	<b>2,743.85</b>
<b>Project pursued under IMPRINT Scheme of MHRD with 50% funding from MHRD and 50% funding from Ministry of Steel</b>																				
1	Indigenous development of a ultra high strength steel with stainless property for space application by IIT Kharagpur (Project No 6456)	317.00	158.50								119.50	25.50			13.50		13.50	158.50	0.00	
2	High strength, wear and corrosion resistant steel for high speed rail and elastic clip by IIT Kanpur (Project No 6777)	396.00	198.00								111.00	45.00			42.00		42.00	198.00	0.00	
3	Model based optimization tool (EAF_OPT) for enhancing Energy Efficiency, Productivity and Yield of Electric Arc Furnaces by IIT Kanpur (Project No 8014)	391.92	195.96								109.32	43.32			43.32		43.32	195.96	0.00	
<b>Total (B)</b>		<b>1,104.92</b>	<b>552.46</b>						<b>0.00</b>	<b>0.00</b>	<b>339.82</b>	<b>113.82</b>	<b>0.00</b>		<b>98.82</b>	<b>0.00</b>	<b>98.82</b>	<b>552.46</b>	<b>0.00</b>	
<b>Grand Total (A+B)</b>		<b>27,781.75</b>	<b>18,761.48</b>	<b>413.50</b>	<b>2,554.62</b>	<b>962.72</b>	<b>2,489.65</b>	<b>800.00</b>	<b>203.00</b>	<b>1,026.13</b>	<b>1,499.99</b>	<b>1,400.00</b>	<b>1,500.00</b>		<b>1,500.00</b>			<b>14,349.61</b>	<b>2,743.85</b>	