

LIST OF ACRONYMS AND ABBREVIATIONS

BEE	Bureau of Energy Efficiency
CTA	Chief Technical Adviser
CII	Confederation of Indian Industry
CCE	Cost of conserved energy
DEA	Department of Economic Affairs
DST	Department of Science and Technology
DSIR	Department of Scientific and Industrial Research
DPR	Detailed Project Report
DIC	Documentation and Information Cell
DEMs	Domestic Equipment Manufacturers
EL	EcoTech level
EMUs	EcoTech Model Units
EMC	Energy Management Center
ESCO	Energy Service Company
EMS	Environment management system
FIs	Financial Institutions
FR	Financial Report
GEF	Global Environment Facility
GDP	Gross Domestic Product
IIM	Indian Institute of Metal
ICICI	ICICI Bank Ltd.
IDBI	Industrial Development Bank of India
IRP	Integrated Resource Planning
IMWG	Inter-Ministerial Working Group
IREDA	Inter-Renewable Energy Development Agency
M A&F	Manager Administration and Finance
MTPY	Million Tonnes Per Year
MEPS	Minimum Energy Performance Standards
MoEF	Ministry of Environment & Forests
MNES	Ministry of Non Conventional Energy Sources
M&E	Monitoring and Evaluation
MEC	Monitoring and Evaluation Cell
NISST	National Institute of Secondary Steel Technology
NPC	National Project Coordinator
NPD	National Project Director
NPP	National Project Personnel
NMCP	Netherlands Management Cooperation Programme
PCRA	Petroleum Conservation Research Association
PATSER	Program Aimed at Technological Self Reliance

PAC	Project Advisory Committee
PMC	Project Management Cell
PSC	Project Steering Committee
PSUs	Public sector undertakings
QOR	Quarterly Operation Report
SMEs	Small and Medium Enterprises
SMPs	Standard Maintenance Practices
SOPs	Standard Operating Practices
SDF	Steel Development Fund
SRRMs	Steel Re-rolling Mills
TA	Technical Assistance
TIRFAC	Technology Information Resource and Facilitation Center
TP	Technology Package
TPF	Third Party Financing
ToR	Terms of Reference
UNFCCC	UN Framework Convention on Climate Change

Additional Information

Appendix 1	Techno - Economic Analysis of Technology Packages
Appendix 2	GEF and Replicated Capacity and Production in 20 Years
Appendix 3	CO2 & Other Emissions Avoided
Appendix 4	Draft Terms of Reference (TORs) for Sub - Contracts
Appendix 5	Draft Terms of Reference for National Project Personnel
Appendix 6	Project Budget & Financing Plan (GEF)
Appendix 7	Implementation Arraignments and Activity Schedule (Work Plan)

Mandatory Annexes

Annex B	Log Frame Matrix
Annex B1	Activity wise break up of Budget
Annex B2	Fund Flow Arrangement
Annex C	STAP Roster Technical Review & Response to STAP review
Annex D	Letters of Endorsement from MoEF
Annex E	In - Principle letters for participation from FIs
Annex F	Project Implementation Arrangements
Annex G	Incremental Cost Matrix

Appendix 1

Techno-Economic Analysis of Technology Packages

No	Packages	EcoTech Options	Energy Saved (GJ/T)	Cost of Conserved Energy (\$/GJ)	Pay Back (years)
Technology Packages					
1	High Efficiency Recuperator in conventional Pusher Hearth Continuous Oil Fired Furnaces with customized packages	High Eff. Recuperator Automation & Control VVVf Drives PF Correction Energy Efficient Drives Energy Efficient Lighting	0.712	(-) 3.95	1.78
2	Change of Oil fired pusher hearth to oil fired walking beam furnace with high efficiency recuperator and customized packages	Walking Beam Furnace High Eff. Recuperator Automation & control VVVf Drives PF Correction EE Drives EE Lighting	0.949	(-) 3.89	2.04
3	Change of Oil fired pusher hearth to gas fired walking beam furnace with REGEN burners	Walking Beam Furnace REGEN Burners PF Correction EE Drives EE Lighting	1.033	(-) 6.92	1.54
4(a)	Lump Coal Pulverized Coal Firing with Recuperator & Customized Package	High Eff. Recuperator Automation & Control VVVf Drives Lump to Pulverized Coal Firing PF Correction EE Drives EE Lighting	2.887	(+) 0.25	4.10
4(b)	Lump Coal to Producer gas fired with HE Recuperator & Customized Package	Producer Gas Firing HE Recuperator Automation & Control VVVf Drives PF Correction EE Drives & Lighting	2.178	(+) 0.26	4.18
5	Hot Charging in Composite Mills (Both oil & gas fired)	Hot/Warm Charging HE Recuperator REGEN Burners EE Drives & Lighting PF Correction Customized Packages	1.05	(-) 4.71	1.5

oil

oil to oil

oil to gas

coal to coal

coal to producer gas

No	Packages	EcoTech Options	Energy Saved (GJ/T)	Cost of Conserved Energy (\$/GJ)	Pay Back (years)
Customized Packages					
1	Combustion (Furnace)	Improved Refractory Lining Ceramic Fiber Veneering High Emissivity Coating High Velocity/Oil Film Burners	0.28	(-) 1.5	0.8
2	Rolling Mill & Electric	Crop Length Optimization Roller Guides Roller Bearing Spindle & Couplings Tilting Tables Drop Tilters Repeaters	0.166	(-) 17.8	0.5

Appendix 2
GEF and Replicated Capacity and Production in Twenty Years

Year	GEF Capacity '000 Tonnes		GEF Capacity in Production '000 Tonnes		Incremental Investment/Cash Flow US \$ ('000)				Net Increment
	Project	Replicated	Project	Replicated	Project	New Capacity	Total	Incremental Operating	
1	206.2	0.0	0	0	3982	0	3982	0	-3982
2	475.8	1364.5	123.7	0	4791	12728	17519	-511	-17008
3	994.2	2210.0	306.1	819	9579	7786	17365	-5555	-11810
4	1418.8	2952.0	664.7	1462	8942	6744	15686	-10158	-5528
5	1762.2	4453.0	998.3	2129	6985	13463	20448	-14795	-5653
6		6217.0	1298.6	3188		15611	15611	-21213	5603
7		7881.0	1375.4	4471		14527	14527	7-28029	13503
8		9575.0	1409.8	5796		14586	14586	-34907	20321
9		11281.0	1409.8	7155		14485	14485	-41848	27363
10		14698.0	1409.8	8514		28605	28605	-48791	20186
11		17827.0	1409.8	10904		25820	25820	-60997	35177
12		20720.0	1409.8	13294		23526	23526	-73200	49674
13		23699.0	1409.8	15685		23869	23869	-85408	61538
14		29054.0	1409.8	18074		42267	42267	-97611	55344
15		29760.0		21874		5488	5488	-111707	106219
16		30960.0		23131		9184	9184	-118126	108941
17		33000.0		24457		15370	15370	-124898	109528
18		34935.0		25872		14347	14347	-132122	117775
19		36893.0		27357		14284	14284	-139706	125422
20		39016.0		28929		15233	15233	-147735	132502
Total			14635.0	243112	34280	317922	352202	-1297316	945114
NPV				257747	23,840	99,841	123,681	-269,992	146,311
IRR				1.5028					31.77%

Appendix 3
CO₂ and Other Emissions Avoided

Year	CO ₂ (Th. Tonnes)	N ₂ O (Tonnes)	TSP (Tonnes)	SO ₂ (Tonnes)	NO _x (Tonnes)	PM 10 (Tonnes)
1	13	0.2	8.5	169.6	77.7	2.7
2	150	3.1	197.1	1859.4	1058.7	59.6
3	289	5.8	385.8	3373.6	1972.1	116.7
4	438	8.7	604.3	4950.9	2971.8	182.8
5	634	12.6	888.6	7036.1	4277.6	268.5
6	830	16.5	1177.4	9233.8	5632.0	355.3
7	1025	20.5	1463.9	11438.7	6983.7	441.3
8	1219	24.5	1750.8	13661.8	8342.4	527.4
9	1413	28.5	2037.7	15885.2	9701.3	613.4
10	1755	35.5	2542.2	19794.6	12090.7	764.8
11	2097	42.5	3046.5	23703.1	14479.6	916.1
12	2439	49.5	3551.0	27612.8	16869.1	1067.4
13	2780	56.5	4055.3	31521.2	19257.9	1218.7
14	3127	64.2	4616.6	35777.3	21866.7	1385.0
15	3307	67.9	4881.9	37833.2	23123.2	1464.6
16	3496	71.8	5161.8	40002.2	24448.9	1548.5
17	3699	75.9	5460.3	42315.9	25863.0	1638.1
18	3911	80.3	5773.7	44744.7	27347.4	1732.1
19	4136	84.9	6105.6	47316.3	28919.2	1831.7
Total	36759	749	53709	418231	255283	16135

Appendix 4
Draft Terms of Reference (TORs) for Sub-Contracts

4.1 Benchmarking for EcoTech Options and Development of Norms

4.1.1 Objectives

To review techno-economic and commercial status of energy efficient clean technologies develop energy and environment labels, standards, benchmarks for equipment and devices used in steel re-rolling industry. To develop investment norms for technology packages and EE options and to prepare information modules for financial institutions, Govt., policy makers, industry partners.

4.1.2 Broad Scope of Work

- To identify & short-list proven technology suppliers for EE technologies/equipment/devices, for combustion, rolling mills, electrical; both nationally and internationally, establish contact through communication and collect all available technology information/data/documents from them, including detailed address list of their customers, etc.
- To undertake visits to select sample units in each of the five geographical clusters, collect required technical information on actual performance and analyze the same to required depth.
- To conduct energy and process audit in two stages- (a) to establish process parameters like specific thermal energy consumption, electrical power, burning loss (%), yield (%), roll consumption norms and (b) Benchmarks for technology packages.
- To develop minimum energy performance standards (MEPS) and average standards for all equipment and devices, energy and environment labels for combustion and mill equipment such as burners, blowers; Recuperator, gearbox, rolls, mill stands, rolls, bearings and lubricants etc.
- Preparation of information modules for dissemination to financial institutions, Govt., policy makers, industry partners.

4.1.3 Indicative Agencies

Domestic Experts/Consultants from Themax, BIS, Steel Companies.

4.2 Development of Standard Methods, Engineering Designs, Implementation Manuals

4.2.1 Objectives

To develop standard methods/tools for design, engineering, maintenance and implementation of EcoTech solutions in SRRM sector and to prepare implementation manuals for technology packages.

4.2.2 Broad Scope of Work

- To develop implementation strategy for benchmarked EE technology packages, equipment and devices

- To establish detailed design, engineering, materials, quality parameters for manufacturing energy efficient devices/equipment like recuperator, mill stand, mill rolls, reheating furnaces, refractory etc. for application in SRRM industry
- Development of models for reheat furnaces, scale formation, recuperator design etc.
- Development of standard methods, operating parameters, maintenance practices and preparation of user manuals for dissemination

4.2.3 Indicative Agencies

Domestic Experts/Consultants from Themax, BIS, Steel Companies.

4.3 Network of Associations of Stakeholders

4.3.1 Objectives

To develop institutional set up for all stakeholders to facilitate experience sharing at local/regional/national level and development of co-operative arrangements in industry to promote development and implementation of EE projects.

4.3.2 Broad Scope of Work

- To develop institutionalized, recognized and effective mechanism for mutual consultation and dialogue among stakeholders.
- To redesign EE business introducing co-operative and participative approach at cluster level in procurement of technology and services of technical experts.
- To develop EE strategy, prioritization of short term/long term policy issues, price policy, linkages with financial policy, involvement of national and regional authority for effective communication.
- To develop cluster/zone level leadership for introduction of IRP, DSM, VA, BP Program etc.
- To develop the Association as a major force for promoting replication of EE projects.

4.3.3 Indicative Agencies

Domestic Experts/Consultants from Mascon Global, IDS, CII.

4.4 Network of Multi - Disciplinary National and International Experts

4.4.1 Objectives

To establish linkages with national/international agencies for securing engineering and design services of experts and to develop low cost solutions for EE projects.

4.4.2 Broad Scope of Work

- To prepare a framework for network of multi-disciplinary national and international experts on the lines of networks managed by USAID and NMCP (Netherlands Management Cooperation Program).
- To identify sources of national/international support for promoting consultancy services.
- To organize the network and make it functional as a self - sustaining institution.

4.4.3 Indicative Agencies

Experts from IDS, USAID, NMCP, DST.

4.5 Business Support Network

4.5.1 Objectives

Developing linkages with bilateral/multi-lateral partners.

4.5.2 Broad Scope of Work

- To develop institutional arrangements and mechanism for technical cooperation and technology transfer at country-to-country level.
- To develop arrangements for participation of bilateral/multi lateral partners in development and implementation of EE projects (e.g. ASEAN - AUS - ASEAN Economic co-operation programme, PH - 3 - energy policy and system analysis program, EU - ASEAN Energy programme or European - Asian Energy Facility (EURASEF), ASEAN - JAPAN co-op in Energy Develop, Japan International Cooperative Agency (JICA).
- To develop linkages and facilitate induction of JI/CDM projects in SRRM industry.

4.5.3 Indicative Agencies

Experts from R&D institutions, DST, BEE.

4.6 Information Dissemination

4.6.1 Objectives

To develop effective information channels for facilitating continuous absorption of technological changes by the industry and other stakeholders.

4.6.2 Broad Scope of Work

- To define information policies in two parts a) unitary: related to needs of all stakeholders and b) split: related to needs of different interest groups.
- To develop a system of worldwide data collection on current/emerging EE technologies, investment costs, projects, markets and opportunities.
- To design a system of storage, retrieval, updating and analysis.
- To evolve a system of information analysis to assess relative advantage of new information, its compatibility with what exists, level of complexity, divisibility and communicability.
- To develop concepts, models & techniques for dissemination of information that gradually leads to a stage of technology adoption starting from the stage of awareness. To formulate target groups as information carriers with a multiplier role.
- To develop comprehensive/interactive web site 'EE-Net' for information on potential, achievements, policy & regulatory framework, frequently asked questions, institutions, experts, equipment/technology suppliers, experts & consultants, related State/Central Govt. agencies, fiscal incentives, technology status, etc.

4.6.3 Indicative Agencies

MIS Experts from Ferguson, A T Kerney, FMG, Price Waterhouse.

4.7 Mapping of SRRM Industry Clusters/Regions

4.7.1 Objectives

To conduct survey of geographical clusters/regions to evaluate scope and opportunities for development of EE projects.

4.7.2 Broad Scope of Work

- To assess level of current technologies and EE status of industry including scope and potential for improvement through intervention of technology and improved operating practices.
- To develop a base paper on status and cluster specific action strategy for catalyzing 'pipeline' EE initiatives/projects.
- To identify specific industry constraints that inhibit EE investments and the type of support services/system expected by the industry.
- To assess role of local consultants operating in the cluster and their limitations vis-à-vis developmental/capacity building needs.
- To interact with local banks/lending agencies to assess the status of bad debts on account of SRRM sector and to facilitate portfolio development for EE projects/investments.
- To identify DEMs, technology providers, suppliers of rolls, refractory and other inputs to the SRRM sector to ascertain the health of industry in the cluster.

4.7.3 Indicative Agencies

NITCON, ITCOT, SAILCON, MECON and similar Consultancy Organisations.

4.8 Development of Network Strategy for Capacity Building

4.8.1 Objectives

The suppliers, banks/FIs, utilities, consultants, authorities, customers, domestic equipment manufacturers etc form an inner circle with industry. Capacity building of these stakeholders and an effective networking would facilitate strengthening of EE capabilities of SRRM industry.

4.8.2 Broad Scope of Work

- To assess capacity building needs for majors stakeholders such as Bank/FIs, suppliers, technical services providers, Authorities (policy regulators), Associations.
- To develop a time bound action plan for implementation of capacity building programme of the major stakeholders.

4.8.3 Indicative Agencies

Institutional development consultants and experts from Ferguson, A T Kerney, FMG.

4.9 Methodologies & Tools of Energy Management

4.9.1 Objectives

To develop systems, procedures and practices that contributes to effective Energy Management.

4.9.2 Broad Scope of Work

- To develop and introduce SOPs, SMPs and Best Practices programme for the SRRM sector and demonstrate its impact.
- To develop training and induction program of Energy-cum-Investment Managers at cluster level.
- To introduce a standard practice of periodic energy/technology/process audits in industry.

4.9.3 Indicative Agencies/Experts

Experts from NPC, BEE, IPM Kansbahl.

4.10 Study of 30 Sample Units (EcoTech Model Units)

4.10.1 Objectives

To undertake continuous monitoring of the sample units for assessment of impacts in post-implementation stage with reference to the baselines.

4.10.2 Broad Scope of Work

- To develop a detailed plan for study of the sample units with requirement of resource personnel, facilities and evaluation system for project implementation, arrangement of finance, procurement of technology/equipment, delivery mechanism, legal issues, investment and re-payment terms/schedules, etc.
- To conduct periodic energy audits and analyse trends in energy consumption/yield improvement/emissions levels. The emission studies to be conducted at stack and zone level to monitor trend with implementation and commissioning of sample units.
- To seek support of international experts for validation of the system/process and methodology of analysis and evolve a regular monitoring strategy in line with IMVP.

4.10.3 Indicative Agencies

NITCON, ITCOT, SAILCON, MECON, Dasturco and similar Consultancy Organisations.

4.11 Energy & Environment Cluster Study of Non-Sample Units

4.11.1 Objectives

To prepare ground for promoting replication in different clusters through detailed energy and environment studies of non-sample units.

4.11.2 Broad Scope of Work

- To develop a blue print for study of non-sample units with explicit objective and outputs that ultimately leads to maturing of pipeline projects.
- To develop transparent norms, criteria and pre-requisites for selection of units in association with local banks/FIs.

- To conduct preliminary and detailed energy/process/technology audits for development of investment proposals and arrange for discussion with select entrepreneurs, FIs, stakeholders, approval agencies, etc.

4.11.3 Indicative Agencies/Experts

NITCON, ITCOT, SAILCON, MECON, Dasturco and similar Consultancy Organisations.

4.12 Financial linkages & Techno Economic Modeling

4.12.1 Objectives

To prepare model (good practice) documents, project development agreements between financial institutions and industry.

4.12.2 Broad Scope of Work

- To develop financial linkages in different clusters according to the size of investments and technology packages.
- To develop techno-economic models for EE investments with norms for evaluation, scrutiny, appraisal at the end of Banks/FIs.
- To develop model investment reports/DPRs for EE investments for dissemination to industry, consultants/project developers.

4.12.3 Indicative Agencies

SIDBI, APCTT, WII.

4.13 Re-Engineering & Validation of Technology Packages

4.13.1 Objectives

To undertake critical review of the technology packages in operation for validation of the assumptions and to make necessary improvements based on feedback from field experience.

4.13.2 Broad Scope of Work

- To undertake detailed diagnosis of technical problems encountered in course of implementation, commissioning and operation of technology packages.
- To work out appropriate solutions in consultation with experts and carry out re-engineering before the packages are cleared for replication in non-sample units.

4.13.3 Indicative Agencies

Project engineering consultant/team of Experts from different fields.

4.14 Performance Contracting Mechanism for ESCOs

4.14.1 Objectives

To develop performance-contracting mechanism involving ESCOs, technology providers and banks/FIs and industry taking guidance from experience of other countries and with adequate safeguards within the legal framework of the country.

4.14.2 Broad Scope of Work

- To prepare detailed operational plan for implementation of 'sample unit' through ESCO route with responsibilities and obligations of both industry and ESCO.
- To develop performance contract agreement along with implementation schedule and sharing of gains with vetting from the legal experts and agencies committed to promotion of ESCO concept.
- To establish legal, Regulatory, accounting and tax rules.

4.14.3 Indicative Agencies/Experts

Experts from Thermax EPS, 3 EC, Management Consultants.

4.15 Institutional Linkages of ESCOs with Technology Providers and industry

4.15.1 Objectives

To develop financing mechanism.

4.15.2 Broad Scope of Work

- To develop arrangements with technology providers, DEMs, banks and financial institutions for seeking line of credit for EE project to be implemented through ESCO route.
- To review arrangements with industry experts, consultants, and institutions and prepare policy research studies on specific aspects of policy and regulatory framework for ESCO and other third party financing mechanisms.
- To identify bilateral funds supporting market development for ESCOs.

4.15.3 Indicative Agencies

APCTT, SIDBI, Price Waterhouse, AIT.

4.16 Assessment of Market Potential for Third Party Financing & ESCOs

4.16.1 Objectives

To conduct research for assessment of market potential based on the experience of sample units implemented through ESCO route.

4.16.2 Broad Scope of Work

- To conduct policy research studies incorporating problems encountered by different agencies and remedial measures.
- To assess market potential for TPF/ESCOs in the steel rerolling and associated business.
- To develop a strong legal basis providing adequate safeguards/risk cover to the TPF/ESCO business.

4.16.3 Indicative Agencies

Market Research Companies with technical background in SRRM sector.

4.17 Development of Project Monitoring & Evaluation System

4.17.1 Objectives

To develop M&E system for achieving the project outputs with quality and within prescribed time schedule.

4.17.2 Broad Scope of Work

- To develop M & E plan for activities/outputs and resources deployed for the project.
- To develop formats for data collection, methodology for analysis and reporting mechanism.
- To set up credible baselines for measuring project impacts with application of 'verifiable indicators' with standardization of procedures and adoption of 'IMVP'.

4.17.3 Indicative Agencies/Experts

Expert institutional consultants/agencies, International Experts.

4.18 Environment Assessment & Monitoring

4.18.1 Objectives

To plan and conduct regular monitoring of stack emissions, ambient air quality and work zone air quality from sample units and specified industry clusters.

4.18.2 Broad Scope of Work

- To develop emissions monitoring plan with adequate infrastructure, standard methods for data collection, analysis and reporting that is conformity with the project goal and objectives.
- To gather emission reports from other sources/agencies for ambient air quality and to asses/isolate contribution or impact of different sources vis-à-vis the steel reolling sector.
- To coordinate with State Pollution Control Boards (SPCBs), local and state administration for projecting the impact of 'pilot sample units'.
- To develop reports on progress in reduction of CO₂ and other emissions.
- To interact with international agencies/experts engaged in environment assessment and monitoring for exchange of information and monitoring/evaluation techniques.

4.18.3 Indicative Agencies/Experts

MECON, NEERI, Envirotech, SAILCON.

4.19 Study for Establishing TIRFAC

4.19.1 Objectives

To prepare a report on suitability of site (SWOT analysis), management structure and sustainability of the center.

4.19.2 Broad Scope of Work

- Asses suitability of location, develop management structure with participation of industry and technology providers, major facilities to be installed with requirement of funds.

- To study similar institutions operating in developed countries, identify specific activities and services of the center with operating expenses and likely sources of revenue.
- To assess sustainability of the center in the long run.

4.19.3 Indicative Agencies/Experts

Institutional development consultancy agencies/experts.

4.20 Civil Engineering Installation & Commissioning of TIRFAC

4.20.1 Objectives

To Develop detailed project report (DPR), supervision, installation and commissioning of TIRFAC facilities.

4.20.2 Broad Scope of Work

- To develop layout plans, specifications of the equipment and arrange budgetary quotations from suppliers.
- To prepare detailed engineering and implementation plan along with requirement of funds.
- To supervise installation and commissioning of various facilities.

4.20.3 Indicative Agency/Experts

Institutional development consultancy firm/experts.

4.21 Project Consultant for Preparation of Project Reports of Sample Units

4.21.1 Objectives

To prepare investment reports for project proposals of sample units for submission to banks and financial institutions.

4.21.2 Broad Scope of Work

- To conduct site study of 30 - sample units and prepare layout plan, modification of drawings as per requirement for implementation of identified technology package for each of the units separately.
- To identify suppliers of equipment and services as per the investment report and obtain budgetary quotations.
- To prepare project report for submission to the bank/FIs with detailed cash flow and returns on investment.
- To identify training needs of operating personnel.

4.21.3 Indicative Agency/Experts

MECON, Singh & Associates, Dasturco, SAILCON, SSS Technologies.

4.22 Project Consultant for Implementation of Sample Units

4.22.1 Objectives

To expand the project report into project document with detailed engineering activities and provide complete consultancy for implementation of projects in 30 sample unit.

4.22.2 Broad Scope of Work

- To expand the project report into project document with detailed engineering plan, terms and conditions of supply and erection and commissioning schedule.
- To supervise erection work for implementation of technology package and associated activities.
- To conduct trial and commissioning of the technology package.
- To prepare a project completion report for each unit.

4.22.3 Indicative Agency/Experts

MECON, Singh & Associates, SAILCON, Dasturco, SSS Technologies.

Appendix 5

Draft Terms of Reference (TORs) for the National Project Personnel

5.1 National Project Director (NPD)

The National Project Director (NPD) will be appointed by the Ministry of Steel in consultation with UNDP for overall supervision of the project. NPD will act as Member Secretary to the Project Steering Committee (PSC) and shall be responsible for overall implementation of the project.

5.1.1 Broad Scope of Work

- To organize/convene Project Steering Committee meetings.
- To facilitate interaction and communication with other Ministries, Govt. Departments, Organizations/Institutions, State Governments.
- To approve, monitor, review work plan and progress of activities.
- To prepare reports/recommendation to the Project Steering Committee.
- To lead the project team comprising NPC, National Consultants and Administrative Project Personnel.

5.2 National Project Coordinator (NPC)

5.2.1 Broad Scope of Work

- Overall responsibility for implementation of the project and achievement of the objective of GHG reduction.
- Liaison with technology providers, DEMs, Consultants, ESCOs, Industry, Research & Academic institutions.
- Establishment of TIRFAC - Hardware and Software centers, development of management system to ensure sustainability.
- Liaison with Government agencies/departments, Banks & Financial Institutions, B-lateral & Multi-lateral funding agencies, foreign diplomats/missions, donors.
- Monitoring & Evaluation reports to Executing Agency (EA) and UNDP/GEF.
- Performance monitoring of sample/model units with regard to investments, implementation, progress review.
- General administration of TIRFAC/PMC.
- Disbursement of funds, maintenance of accounts as per requirements of UNDP and internal Audit.

5.3 Chief Technical Adviser (CTA)

5.3.1 Broad Scope of Work

- Developing internationally linked institutional capacity through joint ventures, technical cooperation and facilitation of technology transfer.
- Developing linkages with national R&D institutions, academic experts.
- Development of energy and environment labels, standards, benchmarks including investment norms of EcoTech options and technology packages.

- Designing standard methods and tools for design engineering and implementation of EcoTech solutions.
- Development of work plan for implementation and monitoring of activities under TA component.
- Setting up TIRFAC - Hardware Center, effective utilization of facilities for sustainability.

5.4 Manager HRD and Marketing

5.4.1 Broad Scope of Work

- To assess capacity needs all stakeholders, preparation of time bound action plan and to organize training workshops on EE technologies, technology management, cooperative procurement of technologies and services.
- To arrange development and promotion of SOPs, SMPs and Best Practice Programme.
- To develop and organize Energy-cum-Investment Managers training programme.
- To facilitate development of network/association of stakeholders.

5.5 Manager Administration & Finance

5.5.1 Broad Scope of Work

- All administrative matters related to PMC/TIRFAC, arrangement of review meetings, record of proceedings, etc.
- Preparation of contracts for assignments, release of funds, maintenance of books of accounts, control of expenditure/payments as per available budget lines and work plan approvals.
- The position of National Project Coordinator requires extensive experience in project design, implementation, evaluation of investment proposals and liaising with national/international institutions, bilateral and multi-lateral funding agencies/donors, etc. The present National Project Manager (NPM) shall continue to work in this position in view of his vast experience and project background. All other positions shall be filled up by inviting applications of eligible candidates through circulars/advertisements as per need.
- In addition to above a number of positions would be required in PMC for implementation of various project activities. These include Technical Experts in the field of rolling, combustion, electrical and automation, expert in project management, systems and software experts, legal advisor, etc. The scope of work for each position will be developed and approved by the PAC prior to recruitment/contracting.

Appendix 6
Project Budget & Financing Plan, covering UNDP - GEF Contribution (in US \$)

Description	W/M	Total	Year					
			1	2	3	4	5	
10 Project Personnel								
11.01 International Experts		203,193	24,894	52,660	69,149	26,809	29,681	
15 Monitoring and Evaluation								
15.01 International Travel		649,048	10,638	119,126	223,613	178,132	117,539	
15.02 Local Travel		376,605	34,991	72,694	93,692	95,034	80,194	
15.99 Sub-total		1,025,653	45,629	191,820	317,305	273,166	197,733	
16 Mission Costs								
16.01 Mission Costs		280,318			52,872	113,723	113,723	
16.99 Sub-total		280,318			52,872	113,723	113,723	
17 National Experts								
17.01 Domestic Experts		500,726	22,979	65,106	134,043	137,489	141,109	
17.02 National Project Personnel		402,783	72,894	76,538	80,365	84,383	88,603	
17.99 Sub-total		903,509	95,873	141,644	214,408	221,872	229,712	
20 Sub Contracts								
21 Benchmarks for ET options and Packages								
21.01 Benchmarking for EcoTech Options & Dev. of Norms		191,489	38,298	76,596	47,872	19,149	9,574	
21.02 Development Std Method, Engg. Designs, Manuals		95,744		23,936	57,447	9,574	4,787	
Total		287,233	38,298	100,532	105,319	28,723	14,361	

22	Strengthening Institutional Arrangements							
22.01	Network of Association of Stakeholders	106,383	10,638	21,277	42,553	21,277	10,638	
22.02	Network of Multi-Disciplinary National and International Experts	319,149	15,957	47,872	127,660	95,745	31,915	
22.03	Business Support Network	106,382	-	-	42,553	53,191	10,638	
	Total	531,914	26,595	69,149	212,766	170,213	53,191	
23	Information Dissemination Programme							
23.01	Information Dissemination	117,020	11,702	23,404	35,106	35,106	11,702	
	Total	117,020	11,702	23,404	35,106	35,106	11,702	
24	Enhanced Stakeholders Capacity							
24.01	Mapping of SRRM Industry Clusters/Regions	63,830	31,915	31,915	-	-	-	
24.02	Dev. of Network Strategy for Capacity Building	21,276	10,638	10,638	-	-	-	
24.03	Methodologies & Tools of Energy Management	53,192	10,638	15,957	21,277	2,660	2,660	
	Total	138,298	53,191	58,510	21,277	2,660	2,660	
25	Feasibility of ET Options/Technology Packages							
25.01	Study of 30 Sample Units (EcoTech Model Units)	319,149	74,468	138,298	106,383	-	-	
25.02	Energy & Env. Cluster Study of Non-Sample Units	410,639	41,064	61,596	82,128	102,660	123,191	
25.03	Financial Linkages & Techno Economic Modeling	63,831	14,894	27,660	21,277	-	-	
25.04	Re-Engineering & Validation of Technology Packages	63,830	-	10,638	21,277	10,638	21,277	
	Total	857,449	130,426	238,192	231,065	113,298	144,468	

26	Innovative Institutional Mechanism (ESCO)							
26.01	Performance Contracting Mechanism for ESCOs	127,660	25,532	31,915	57,447	12,766	-	
26.02	Inst. Linkages of ESCOs with Tech. Providers	74,469	14,894	18,617	33,511	7,447	-	
26.03	Assessment of Market Potential for TPF & ESCOs	275,532	-	-	0	165,319	110,213	
	Total	477,661	40,426	50,532	90,958	185,532	110,213	
27	TIRFAC Established							
27.01	Development of Pro. Monitoring & Evaluation System	42,553	42,553	-	-	-	-	
27.02	Environment Assessment & Monitoring	106,385	21,277	21,277	21,277	21,277	21,277	
	Total	148,938	63,830	21,277	21,277	21,277	21,277	
29.99	Component Total	2,558,513	364,468	561,596	717,768	556,809	357,872	
30	Training and Workshops							
	Capacity Building Training workshops	1,313,023	107,071	217,822	392,466	329,716	265,948	
45	Equipment	79,768	21,267	58,501	-	-	-	
50	Miscellaneous							
52.01	Reporting Costs & Sundries	384,023	36,054	90,508	96,599	84,825	76,037	
52.02	Audit	2,000	400	400	400	400	400	
59	Component Total	386,023	36,454	90,908	96,999	85,225	76,437	
	Grand Total	6,750,000	695,256	1,314,551	1,860,567	1,606,920	1,271,356	

Appendix 7
Implementation Arrangement and Activity Schedule (Work Plan)

SL No.	Output Activity	Period in Quarters																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Benchmarks for ET options and Packages																				
1.01	Benchmarking for ET options/norms																				
1.02	Development of Std. methods/manuals																				
2	Strengthening Institutional Arrangements																				
2.01	Network of association of stakeholders																				
2.02	Network of Multi-Disciplinary Experts																				
2.03	Business Support Network																				
3	Information Dissemination Programme																				
3.01	Establishment of worldwide database																				
4	Enhanced Stakeholders Capacity																				
4.01	Mapping of SRRM Industry																				
4.02	Network Strategy																				
4.03	Methodology and Tools of Energy Mgt.																				
5	Feasibility of ET options/Tech Packages																				
5.01	Study of 30 Sample units (EMUs)																				
5.02	EE Cluster study of Non-sample units																				
5.03	Financial Linkages & TE Modeling																				
5.04	Re-Engg. & Validation of Tech Packages																				

5742

SL No.	Output Activity	Period in Quarters																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
6	Innovative Instl. Mechanism (ESCOs)																				
6.01	Performance Contracting Mechanism																				
6.02	Institutional Linkages of ESCOs																				
6.03	Assessment of Market Potential																				
7	TIRFAC Established																				
7.01	Development of Project M&E System																				
7.02	Environment assessment and Monitoring																				
7.03	Study for establishing TIRFAC																				
7.04	Civil Engg. Installation & Commissioning																				
8	Feasibility of EcoTech options and Technology Packages (Sample Units)																				
8.01	Preparation of Project Reports																				
8.02	Implementation and Commissioning																				

	<ul style="list-style-type: none"> • Preparation of Project Reports • Implementation and Commissioning 	<ul style="list-style-type: none"> • TIRFAC • Environment assessment and Monitoring • Study for establishing TIRFAC • Civil Engg. Installation & Commissioning 	<ul style="list-style-type: none"> • Innovative Instl. Mechanism (ESCOs) • Performance Contracting Mechanism • Institutional Linkages of ESCOs • Assessment of Market Potential
--	--	--	---

Annexure B
Logframe Matrix

Strategy	Indicators	Means of Verification	Assumptions
Overall Project Goal (Impact)			
To reduce GHG emissions in the steel rerolling mill (SRRM) sector in India.	<ul style="list-style-type: none"> Compliance with established energy & environment efficiency norms of EcoTech options & technology packages adopted. Bi-annual cluster reports and Annual country reports (incl. model units) 'Progress Ratio' measurement study after every 2 years. Beginning first year EcoTech coverage increases to 25% by end of fifth year. 	<ul style="list-style-type: none"> Annual statistical progress report of Ministry of Steel (Office of the DCI&S). 'Green' Balance Sheets of SRRM Units (by TIRFAC) Baseline & EcoTech study reports (by TIRFAC) 	Ministry of Steel (EA) sets up an internationally linked self-financing institutional capacity and maintains the required human and financial resources.
Project's Goal (Outcome)			
To improve energy efficiency in the SRRM Sector by expanding private sector investments in 'win-win' nature of low GHG emitting technologies (EcoTechs).	Share of EcoTech increased to 25% (3 million tons) by end of the project period resulting in cumulative energy saving of 9 PJ and 0.88 million tons of reduction in CO ₂ emissions.	<ul style="list-style-type: none"> Bi-annual and annual study reports of TIRFAC based on regular field studies. Collection of data from secondary sources 	<ul style="list-style-type: none"> Market demand, Policy and regulatory framework sustained. Adequate availability of semis Required equity/credit is available.
Outputs/Components			
1. Benchmarks for ecotech options and technical packages established and validated			
<ul style="list-style-type: none"> Energy and environment labels, standards, and benchmarks including 	<ul style="list-style-type: none"> Industry complies with energy-cum-environment performance norms benchmarked against 'best-practice' norms 	<ul style="list-style-type: none"> Comparison with 'Best-practice' norms Verification by panel of 	<ul style="list-style-type: none"> Technology sources are available.

<p>investment norms of EE options and technology packages developed.</p> <ul style="list-style-type: none"> Standardized methods and tools for design, engineering and implementation of ecotech solutions designed. Information modules for financing institutions, government and policy makers, and industry partners developed. 	<p>achieved in respect of similar technologies in India or abroad* and validated through actual performance of EMUs after one year of their stabilization.</p> <ul style="list-style-type: none"> Techno-economic viability including cost recovery (CCE, IRR, Payback, BEP, etc.) is established. Energy labels and standards developed by end of third year. Information modules (1c) developed and disseminated by the end of 18 months of the start of the project. 	<p>experts</p> <ul style="list-style-type: none"> Results documented for EMUs Week long continuous operation Standard design and implementation manuals prepared and distributed Feedback reports from FIs, Govt and policy planners and industry. 	<ul style="list-style-type: none"> Sources are keen to build up the market by tailoring technologies to match size and configuration the mills Local expertise for implementation is available.
<p>2. Institutional Arrangements Strengthened</p>			
<ul style="list-style-type: none"> Networks of association of private and public institutions and companies, bilateral and multilateral organizations, financial institutions providing technical, financial and market inputs to the sector within the legal framework of the nation developed. Business networks through self-financed association of multi-disciplinary experts including successful entrepreneurs. Institutional capacity to facilitate technology transfer developed. 	<ul style="list-style-type: none"> Job contracted to specialist agency/organization, preferably, international with sufficient experience in the line. Completed successfully by the end of 3rd year. Job as includes establishment of business support networks and development of internationally linked institutional capacity. Hardware facilities namely prototype development, technology testing and calibration along with software facilities put in operation by the end of 3rd year. Design, standards and implementation manuals put in practice during the same period. 	<ul style="list-style-type: none"> Annual project implementation report by PMC. 	<ul style="list-style-type: none"> Means of communication s available Willingness to participate and collaborate
<p>3. Effective Information Dissemination Program Developed</p>			

* duly adjusted to input/output and other related conditions of operations (scale of operation, etc)

<ul style="list-style-type: none"> Establishing worldwide database on current and emerging EE technologies including sources of supply and investment costs, expert analysis, projects, markets, opportunities, and related stakeholders. Disseminating information through newsletters, technical bulletins, website and expert presentation, 	<ul style="list-style-type: none"> Report identifying information needs, information sources, dissemination channels and MIS finalized by end of 1st year. System design, data collection, alliances and mechanism established by end of 2nd year. Information dissemination channels & access procedures operational zed by end of 3rd year. 	<ul style="list-style-type: none"> Feedback from stakeholders based on responses. National & regional workshops arranged in 5 years for information dissemination and awareness. Publications 	<ul style="list-style-type: none"> Competent task-specific expertise is locally available.
4. Stakeholders capacity enhanced			
<ul style="list-style-type: none"> Carrying out capacity needs assessment of the major stakeholders to implement and absorb advanced EE technologies in the sector. Identifying specific capacity building needs for preparation and implementation of a time-bound action plan for capacity building of the major stakeholders. Conducting training programs/workshops in EE Technologies and Technology Management including cooperative procurement of EE technologies in clusters, engineering and implementation support. Developing Standard 	<ul style="list-style-type: none"> Technology, resource and capacity building needs of each cluster mapped in first year time bound action plan. Master plan for capacity building activities is finalized and documented by 13th month. 5 cluster workshops for units/DEMs/consultants on 'new' technologies and technology management each year 10 Workshops for unit owners/managers on cooperative management practices and procurement processes in each of 5 clusters over 5 years. Standard Operating Practices (SOP) and Standard Maintenance Practices (SMP) developed in third and fourth year 'Best Practices' program developed in second year and workshops conducted in third and fourth year. 	<ul style="list-style-type: none"> Annual Project Implementation Reports and Reviews (Short, Mid & Long-term). Formal participants' satisfaction survey conducted at conclusion of each capacity building activity (Level I) Formal participants' skill evaluation at conclusion of every capacity building activity (Level II) Independent Peer Reviews (IPRs) for capacity building efforts. Action Taken Reports (ATRs) for capacity building activity plan. 	<ul style="list-style-type: none"> Policy and administrative support at all levels due to involvement of ministry of steel. Competitive training/ capacity building resources including modern software facilities are available

<p>Operating Practices (SOP) and Standard Maintenance Practices (SMP)</p> <ul style="list-style-type: none"> Facilitating absorption and assimilation of 'Best Practices'. Training of trainers' programme for developing industrial and institutional in-house capacity such as development of Energy-cum-Investment managers. Training local, state and central level banks, state financial institutions, manufacturers, and suppliers of services and local/regional consultant. Institutional collaboration/tie-ups with clusters to facilitate new EE projects. 	<ul style="list-style-type: none"> Three exposure visits to developed countries for DEMs/local consultants. 5 interaction and policy-oriented workshops for central/state govt. institutions on complex SME issues and constraints. 3-week training program and curriculum developed by the end of first year for developing Energy-cum-Investment Managers. 5 programs, one in each cluster, conducted in 2nd, 3rd, and 4th year. Pilot programs for local govt., administrators, and planners focusing on energy efficiency and greening of environment conducted in each cluster beginning second year. Workshops on evaluating of EE technologies and projects for financing/banking sector. 		
---	---	--	--

5. Technical and financial feasibility of ecotech options and technical packages established

<ul style="list-style-type: none"> Developing financial linkages and guidelines for support to pilot testing of packages in sample mills. Implementing 5 technology packages in 30 sample mills – 23 on one-to-one basis and 7 through ESCOs. Verifying techno-economic viability of the packages including cost recovery, performance and the impacts. Documenting implementation 	<ul style="list-style-type: none"> EcoTech Packages implemented and operationalised in 30 units: 3 units in 1st year, 4 in 2nd year, 9 in 3rd year, 8 in 4th year and 6 in 5th year. Documentation of lessons learned in successive years as above. Multiplication strategy package wise developed and recommended in successive years in accordance with successful implementation of packages as above. 	<ul style="list-style-type: none"> Progress report on implementation of demonstration units. 'Best Practice' reports prepared by a Group of national and international experts based on demo units' operation. 	<ul style="list-style-type: none"> Acceptance of the project by major stakeholders. Executing agency ensures implementation at minimum cost.
--	--	--	--

<p>experience for developing model implementation practice.</p> <ul style="list-style-type: none"> Disseminating the lessons learnt to wide range of stakeholders. 			
6. Innovative institutional mechanisms established			
<ul style="list-style-type: none"> Developing mechanisms of performance contracting involving identified ESCOs (Thermax EPS, INTESCO ASEA, ELPRO ENERGY CENTER, SEETECH INDIA, DCM. and 3EC) and technology providers Strengthening capacity of the ESCOs for implementing identified technical packages for the mills Developing institutional linkages among existing ESCOs, technology providers and industry Evaluating the market potential through demonstrating ESCO concept in 7 mills 	<ul style="list-style-type: none"> ESCOs identified. Performance capability of ESCOs specific to the needs of rerolling mills enhanced by the end of 2nd year Market transformation strategy developed and implemented at end of the 2nd year. 5 ESCOs operationalised from third year. Demonstration of EcoTech packages in 7 units through ESCO route between 3rd and 5th year. A minimum of 90% of EE solutions (EcoTech options/tech. Packages proposed under the project) become locally available at conclusion of the project. 	<ul style="list-style-type: none"> Project completion reports by ESCOs as per agreement. Annual Market Survey Reports. 	<ul style="list-style-type: none"> Availability of national & international ESCOs and their willingness to participate.
7. Technology Information Resource and Facilitation Centre Established			
<ul style="list-style-type: none"> Setting up of a project management and coordination unit for implementing project activities Developing a comprehensive work-cum-implementation 	<ul style="list-style-type: none"> PMC set up in 10 weeks after project approval by GEF Council. Annual Work plan approved by PSC and job order issued which coincides with 'zero' date of the project. Master plan for project activities is finalized and documented in first 10 	<ul style="list-style-type: none"> Job Order issued Project Progress & Completion reports (PPR & PCR) plus mid-term Review and Action Taken Reports by Project Advisory Committee. 	<ul style="list-style-type: none"> Competent task-specific expertise is locally available. Policy and administrative

<p>and monitoring plan for activities in the TA component</p> <ul style="list-style-type: none"> • Reporting to funding agencies as per the pre-determined progress indicators for various activities in the project. • Documenting lessons learnt for all project activities and their objective vis-à-vis outputs. • Establishing technology information and Facilitation Centre. 	<p>weeks.</p> <ul style="list-style-type: none"> • Monitoring and Evaluation Plan along with reporting procedures finalized and PMC staff appointed at the end of 6th month. • Monthly/quarterly/annual performance review formats prepared for adoption by all project constituents at the end of 6 months. • Software and hardware centers of TIRFAC set up at the end of 2nd and 3rd year respectively. 	<ul style="list-style-type: none"> • Annual Disbursement and Audit Reports 	<p>support at all levels is available.</p> <ul style="list-style-type: none"> • Financial resources (GEF and non-GEF) are available in time. • EA exercises financial discipline to ensure implementation of project at minimum cost.
--	---	---	---

Annex B1
Activity wise Budget Details for GEF & NEX Contributions

CMBL11.01		INTERNATIONAL CONSULTANTS								
ACTIVITY	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total	
Benchmarks for ET options and Packages	2.0	GEF	5745	14362	22979	0	14362	57447		
	0.0	NEX	0	0	0	0	0	0	57447	
Strengthening Institutional Arrangements	2.0	GEF	0	11489	11489	22979	11489	57447		
	0.0	NEX	0	0	0	0	0	0	57447	
Feasibility of ET options/Technology Packages	1.0	GEF	11489	17234	0	0	0	28723		
	0.0	NEX	0	0	0	0	0	0	28723	
Innovative Institutional Mechanism (ESCO)	1.3	GEF	7660	9574	13404	3830	3830	38298		
	0.0	NEX	0	0	0	0	0	0	38298	
TIRFAC Established	0.7	GEF	0	0	21277	0	0	21277		
	0.0	NEX	0	0	0	0	0	0	21277	
Total	7.0	GEF	24894	52660	69149	26809	29681	203191		
	0.0	NEX	0	0	0	0	0	0	203191	
CMBL 13		ADMINISTRATIVE STAFF								
Project Management Cell		GEF	0	0	0	0	0	0		
		NEX	10213	10723	11260	11823	12414	56432	56432	
CMBL 15.01		INTERNATIONAL TRAVEL								
Benchmarks for ET options and Packages		GEF	0	10717	77582	77582	67098	232979		
		NEX	0	0	0	0	0	0	232979	

ACTIVITY	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
----------	-----	--	----------	----------	----------	----------	----------	-------	-----------

Strengthening Institutional Arrangements	GEF	0	27234	43830	37872	27234	136170		
	NEX	0	0	0	0	0	0	136170	
Feasibility of ET options/Technology Packages	GEF	10638	0	0	0	0	10638		
	NEX	0	0	0	0	0	0	10638	
Innovative Institutional Mechanism (ESCO)	GEF	0	81174	81174	40587	0	202936		
	NEX	0	0	0	0	0	0	202936	
Monitoring & Evaluation System	GEF	0	0	0	0	0	0		
	NEX	25532	0	25532	0	25532	76596	76596	
TIRFAC Established	GEF	0	0	21277	22340	23457	67074		
	NEX	0	0	0	0	0	0	67074	
Total	GEF	10638	119126	223863	178382	117789	649798		
	NEX	25532	0	25532	0	25532	76596	726394	
CMBL 15.02	LOCAL TRAVEL								
Benchmarks for ET options and Packages	GEF	3191	19149	19149	19149	3191	63830		
	NEX	0	0	0	0	0	0	63830	
Strengthening Institutional Arrangements	GEF	6383	13830	13830	13830	13830	61702		
	NEX	0	0	0	0	0	0	61702	
Information Dissemination Programme	GEF	0	0	0	0	0	0		
	NEX	0	25532	25532	25532	25532	102128	102128	
Enhanced Stakeholders Capacity	GEF	14298	28596	28596	28596	28596	128681		
	NEX	0	0	0	0	0	0	128681	
Monitoring & Evaluation System	GEF	11119	11119	11119	11119	11119	55596		
	NEX	25532	25532	25532	25532	25532	127660	183255	
TIRFAC Established	GEF	0	0	21277	22340	23457	67074		
	NEX	0	0	0	0	0	0	67074	
Total	GEF	34991	72694	93970	95034	80194	376883		
	NEX	25532	51064	51064	51064	51064	229787	606670	
ACTIVITY	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
CMBL 16	MISSION COST								
Monitoring & Evaluation and TIRFAC	33	GEF	0	0	52872	113723	113723	280319	

	60	NEX	38298	47872	59840	74801	93501	314312	594631
CMBL 17.01	DOMESTIC EXPERTS								
Benchmarks for ET options and Packages	0	GEF	0	0	0	0	0	0	
	144	NEX	7660	45957	61277	30638	7660	153191	153191
Strengthening Institutional Arrangements	24	GEF	2553	5106	5106	5106	5106	22979	
	192	NEX	0	37021	37021	37021	37021	148085	171064
Information Dissemination Programme	383	GEF	20426	60000	60000	60000	60000	260426	
	0	NEX	0	0	0	0	0	0	260426
Enhanced Stakeholders Capacity	0	GEF	0	0	0	0	0	0	
	864	NEX	63830	127660	127660	127660	127660	574468	574468
Monitoring & Evaluation System	0	GEF	0	0	0	0	0	0	
	75	NEX	15160	15918	16713	17549	18427	83766	83766
TIRFAC Established	36	GEF	0	0	68936	72383	76002	217321	
	0	NEX	0	0	0	0	0	0	217321
Total	443	GEF	22979	65106	134043	137489	141109	500726	
	1275	NEX	86649	226556	242671	212868	190767	959511	1460236
CMBL 17.02	NPP								
Project Management Cell	398	GEF	72894	76538	80365	84383	88603	402783	402783
CMBL 20	CONTRACTS								
Contract No									
21. Benchmarks for ET options and Packages									
21.01	40	GEF	38298	76596	47872	19149	9574	191489	
		NEX	0	0	0	0	0	0	191489
ACTIVITY	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
21.02	30	GEF	0	23936	57447	9574	4787	95745	
		NEX	0	0	0	0	0	0	95745
22. Strengthening Institutional Arrangements									
22.01	42	GEF	10638	21277	42553	21277	10638	106383	

		NEX	0	0	0	0	0	0	106383
22.02	40	GEF	15957	47872	127660	95745	31915	319149	
		NEX	0	0	0	0	0	0	319149
22.03	15	GEF	0	0	42553	53191	10638	106383	
		NEX	0	0	0	0	0	0	106383
23. Information Dissemination Programme									
23.01	40	GEF	11702	23404	35106	35106	11702	117021	
		NEX	0	0	0	0	0	0	117021
24. Enhanced Stakeholders Capacity									
24.01	17	GEF	31915	31915	0	0	0	63830	
		NEX	0	0	0	0	0	0	63830
24.02	17	GEF	10638	10638	0	0	0	21277	
		NEX	0	0	0	0	0	0	21277
24.03	27	GEF	10638	15957	21277	2660	2660	53191	
		NEX	0	0	0	0	0	0	53191
25. Feasibility of ET options/Tech Pkgs.									
25.01	32	GEF	74468	138298	106383	0	0	319149	
		NEX	0	0	0	0	0	0	319149
25.02	56	GEF	41064	61596	82128	102660	123191	410638	
		NEX	0	0	0	0	0	0	
	60	IND	125000	187500	250000	312500	375000	1250000	1660638
25.03	31	GEF	14894	27660	21277	0	0	63830	
		NEX	0	0	0	0	0	0	63830
25.04	43	GEF	0	10638	21277	10638	21277	63830	
		NEX	0	0	0	0	0	0	63830

ACTIVITY	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
26. Innovative Institutional Mechanism (ESCO)									
26.01	27	GEF	25532	31915	57447	12766	0	127660	
		NEX	0	0	0	0	0	0	127660
26.02	33	GEF	14894	18617	33511	7447	0	74468	

		NEX	0	0	0	0	0	0	74468
26.03	18	GEF	0	0	0	165319	110213	275532	
		NEX	0	0	0	0	0	0	275532
27.	Feasibility of ET options and Tech Pkg. (Sample Units)								
27.01	60	IND	385000	460000	920000	855000	670000	3290000	3290000
27.02	60	IND	200000	200000	200000	200000	200000	1000000	1000000
28.	Monitoring & Evaluation System								
28.01	12	GEF	42553	0	0	0	0	42553	
		NEX	0	0	0	0	0	0	42553
28.02	60	GEF	21277	21277	21277	21277	21277	106383	
		NEX	0	0	0	0	0	0	106383
29.	Tech Information Resource and Facilitation Centre								
29.01		GEF	0	0	0	0	0	0	
	12	NEX	105745	0	0	0	0	105745	105745
29.02		GEF	0	0	0	0	0	0	
	36	NEX	67979	135957	135957	0	0	339894	339894
		NEX	0	0	0	0	0	0	63830
GEF	580		364468	561596	717766	556809	357872	2558511	
NEX	48		173723	135957	135957	0	0	445638	
IND	180		710000	847500	1370000	1367500	1245000	5540000	
TOTAL	808		1248191	1545053	2223723	1924309	1602872	8544149	8544149

ACTIVITY	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total	
CMBL 30	Ref.	TRAINING/WORKSHOPS								
Enhanced Stakeholders Capacity	11	175	GEF	94305	182715	265232	311205	159139	1012596	
		99	NEX	53522	103699	150530	176622	90318	574691	1587287
	12	16	GEF	0	9574	92766	9574	102340	214255	
		0	NEX	0	0	0	0	0	0	214255
	13	0	GEF	0	0	0	0	0	0	
		46	NEX	0	29787	29787	29787	29787	119149	119149

Innovative Institutional Mechanism (ESCO)	18	3	GEF	0	0	8936	8936	4468	22340	
		0	NEX	0	0	0	0	0	0	22340
	19	30	GEF	6383	12766	12766	0	0	31915	
		0	NEX	0	0	0	0	0	0	31915
	20	30	GEF	6383	12766	12766	0	0	31915	
		0	NEX	0	0	0	0	0	0	31915
TOTAL		254	GEF	107071	217822	392466	329716	265948	1313021	
		145	NEX	53522	133486	180318	206410	120105	693840	2006862
CMBL 40	EQUIPMENT									
Enhanced Stakeholders Capacity	11		GEF	0	0	0	0	0	0	0
			NEX	36338	54507	72677	13627	4542	181691	181691
Innovative Institutional Mechanism (ESCO)	18		GEF	0	0	0	0	0	0	
			NEX	0	0	11915	11915	5957	29787	29787
	19		GEF	0	0	0	0	0	0	
			NEX	0	0	107234	107234	53617	268085	268085
Monitoring & Evaluation System	1		GEF	21277	15957	0	0	0	37234	
			NEX	21277	0	0	0	0	21277	58511

Activity	Ref.	W/M		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
	2		GEF	0	42553	0	0	0	42553	
			NEX	0	0	0	0	0	0	42553
TIRFAC Established	3		GEF	0	0	0	0	0	0	
			NEX	0	755904	755904	0	0	1511809	1511809
TOTAL			GEF	21277	58511	0	0	0	79787	
			NEX	57615	810412	947730	132776	64117	2012649	2092436
CMBL 50	MISCELLANEOUS									
Worksheet Ref.	Exp. A/c									
Benchmarks for ET options and Pkgs.	Reporting	GEF		2979	17872	23830	11915	2979	59574	

		NEX	0	0	0	0	0	0	59574
Strength. Instl. Arrangements	Reporting	GEF	1277	34468	34468	34468	34468	139149	
		NEX	0	0	0	0	0	0	139149
Information Dissemination Programme	Reporting	GEF	4255	4255	4255	4255	4255	21277	
		NEX	0	0	0	0	0	0	21277
Enhanced Stakeholders Capacity	Reporting	GEF	6241	12482	12482	12482	12482	56170	
		NEX	0	0	0	0	0	0	56170
Activity	Expense A/c		1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
Feasibility ET options	Reporting	GEF	10638	10638	10638	10638	10638	53191	
		NEX	0	0	0	0	0	0	53191
Innovative Instl. Mechanism	Reporting	GEF	8511	8511	8511	8511	8511	42553	
		NEX	0	0	0	0	0	0	42553
TIRFAC Established	Repair & Maint.	GEF	0	0	0	0	0	0	
		NEX	2553	2681	2815	2956	3103	14108	

	Reporting	GEF	2553	2681	2815	2956	3103	14108	
		NEX	2553	0	0	0	0	2553	
	Utility	GEF	0	0	0	0	0	0	
		NEX	4248	4460	4683	4917	5163	23472	
	Meetings	GEF	0	0	0	0	0	0	
		NEX	3830	4021	4222	4433	4655	21162	75403
TOTAL		GEF	36454	90908	96999	85225	76437	386023	447318
		NEX	13184	11162	11721	12307	12922	61295	447318

CMBL		PROJECTS-SAMPLE UNITS							
Activity		W/M	1st year	2nd year	3rd year	4th year	5th year	Total	Act Total
30 Sample Units	GEF		0	0	0	0	0	0	
	NEX		282000	340000	679000	634000	495000	2430000	

	FIs/OTHERS	1312000	1578000	3155000	2945000	2300000	11290000
	INDUSTRY	0	0	0	0	0	0
DEMs	GEF	0	0	0	0	0	0
	NEX	0	0	0	0	0	0
	FIs/OTHERS	200000	200000	200000	200000	200000	1000000
	INDUSTRY	0	0	0	0	0	0
TOTAL	GEF	0	0	0	0	0	0
	NEX	282000	340000	679000	634000	495000	2430000
	FIs/OTHERS	1512000	1778000	3355000	3145000	2500000	12290000
	INDUSTRY	0	0	0	0	0	0
GRAND TOTAL (Rounded to 1 st Digit)	GEF	695665	1314959	1861493	1607570	1271355	6751040
	NEX	766268	1767233	2345092	1336047	1065421	7280060
	FIs/OTHERS	1512000	1778000	3355000	3145000	2500000	12290000
	INDUSTRY	710000	847500	1370000	1367500	1245000	5540000
		3683933	5707692	8931585	7456117	6081776	31861100