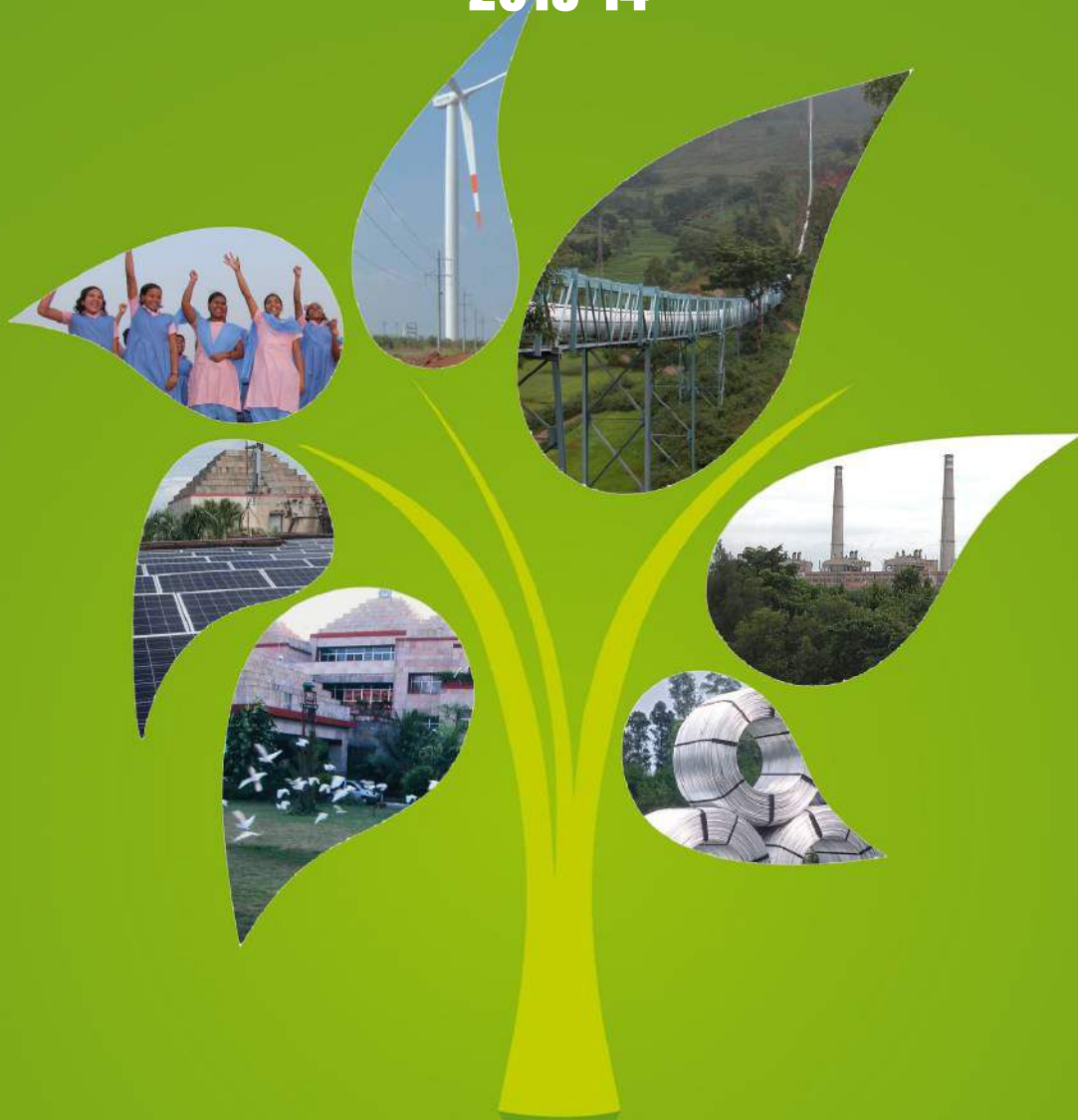


3rd SUSTAINABLE DEVELOPMENT REPORT

2013-14



SUSTAINABLE METAL GREEN ENERGY

GRI G3.1
Application Level 'A'
Report

Our Vision

To be a reputed global Company in the Metals and Energy Sectors.

Our Mission

To achieve sustainable growth in business through diversification,
innovation and global competitive edge

To satisfy the customers and shareholders, employees and all other stake holders.

To continuously develop human resources, create safe working conditions,
improve productivity and quality and reduce cost and waste

To be a good corporate citizen, protecting and enhancing the environment as well as
discharging social responsibility in order to ensure sustainable growth

To intensify R&D for technology development.



Sustainable Development Report

2013-14

Sustainable Development Policy

Sustainable Development is an integral part of our business with specific focus on economic, social, environmental & energy related issues. We also dedicate ourselves to strive for continual improvements in our systems, processes, procedures and work ethos for enhancing satisfaction of all our stakeholders, guided by the following principles.

GUIDING PRINCIPLES

Relentless pursuit of holistic advancements in Quality, Productivity, Safety, Occupational Health, Innovation & Technology including adoption of Green Technology with a view to enhancing value creation for all stakeholders.

Embedding integrity, ethical 'Human Rights' practices, transparency, mutual trust and respect with commitment to social responsibility in all our operations for driving inclusive growth and harmonious socio-economic development of communities.

Aligning our growth with preservation of natural resources; eco-systems & biodiversity; environmental excellence; waste utilisation; energy efficiency and reduction of Green House Gas emissions.

COMMITTMENT

We are committed to continually improve with focus on issues pertaining to economic, social, energy conservation and environmental protection to ensure a better planet for future generations.



About this Report

For NALCO, Reporting on Sustainable Development transcends the routine & run of the mill approach of document preparation. It is a process by which we assess our business risks and their impact, leading to development of strategies to address them. It is a way by which we plan to take care of the concerns of our stakeholders and a mechanism of sharing information regarding the steps taken so far. The process also serves as a tool for learning and improvement.

The report for financial year 2013-14 is based on the above premises, providing an update on various developments that have taken place during the reporting period. Transparency and accountability are the corner stone of the report.

This is our third Sustainable Development Report covering the financial year 2013-14. This report and the earlier two reports (for 2011-12 & 2012-13) are available on the website (www.nalcoindia.com). Our first Sustainability Report was aligned to the nine principles of National Voluntary Guidelines issued by the Ministry of Corporate Affairs, Government

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of India. The second Sustainable Development Report and the present one are as per GRI G3.1 guidelines, including the Metal Mining Sector supplement.

This report contains information from our diverse business operations including Bauxite Mine & Alumina Refinery at Damanjodi, Smelter Plant & Captive Power Plant at Angul with Port Facilities at Visakhapatnam. Other entities like joint ventures, stockyards, offices are not included in the report scope. The data, information reported are based on reliable data sources maintained by respective units covered in the scope of reporting, supplemented by computation, estimation done on the basis of certain assumptions. Required indication of the procedure/system of data collection are provided at appropriate places in the Economic, Environment and Social disclosures.

In keeping with our value of constant improvement, we encourage our readers to share their feedback and value their suggestions. Send us your queries/suggestions to sustainability@nalcoindia.co.in.

HIGH POINTS 2013-14



Highest Ever Production in Mines & Refinery

Bauxite Mines achieved the highest ever production since inception with transportation of 62.93 lakh MT against previous best of 54.19 lakh MT achieved last year. Alumina Refinery also achieved highest ever alumina hydrate production of 19.25 lakh MT, compared to 18.02 lakh MT achieved previous year.

Highest Ash Utilisation

CPP has achieved highest ever ash utilisation of 71.67% during the year compared to 66% during previous year.



Highest ever Export sales

NALCO has achieved the highest ever export sales at ₹ 3719 crore during the year against earlier highest ever sale of ₹ 3410 crore during the previous year.

Awards & Accolades



IIM Non-ferrous Best Performance Award for FY 2012-13 amongst the large integrated plants category, instituted by the Indian Institute of Metals.



Shri S.C. Padhy, Director (HR) receiving the award for NALCO's CSR initiatives at the World CSR Conclave.



Nalco being awarded Engineering Export Promotion council (EEPC), Eastern Region's Gold Trophy as top Exporter in the Large Enterprise category at Kolkata in January 2014

2nd Wind Power Plant

NALCO, in its endeavour towards green energy commissioned the 2nd Wind Power Plant of 47.6 MW in Jaisalmer, Rajasthan in Jan 2014.



Best CSR Practices

'Best Corporate Social Responsibility Practices-2013' was award to the NALCO Foundation, the CSR arm of Company at the Responsible Business Summit & Awards.



Roof-top Solar System

As a part of its green initiative, the Company has taken up installation of roof top solar system in Bhubaneswar Corporate Office (160 kWp), which is in advance stage of Commissioning.



Golden Performance Excellence Award 2013 instituted by Indian Institution of Industrial Engineering (IIIE), Mumbai.



Panchpatmali Bauxite Mines of NALCO has bagged the "Sita Ram Rungta Social Awareness Award 2013-14", instituted by Federation of Indian Mineral Industries (FIMI) at New Delhi.



Shri V. Balasubramanyam, Director (Production), receiving National Energy Conservation Award in appreciation of NALCO's efforts in Energy Conservation.



Dear Stakeholders,

We have always demonstrated a sincere concern for the people and the planet while pursuing our economic objectives. 'Sustainability' is deeply embedded in our business practices. Our commitment to Stakeholders, is reflected in addressing their long-term interests through our Sustainability agenda. In this context, I take great pleasure in presenting you, our 3rd Annual Sustainable Development Report.

Despite the prevalent sluggish macro-economic indicators, through **strategic interventions**, we not only sustained our growth, but also achieved **higher net profits**, compared to that of the preceding years. With the average cash price per tonne of Aluminium in the London Metal Exchange varying as low as, USD 1703 to USD 1857 during the year, the global aluminium scenario was a bit sombre. In view of these uncertainties, a strategic decision was taken to curtail metal production commensurate with power generation from linkage and e-auction coal. A focussed approach in the Alumina sector, resulted in **the highest ever production at Mines & Refinery Complex, and highest ever sales of Calcined Alumina in global and domestic markets.**

New initiatives planned in this sector, Fixed Long

Distance Conveyor and Semi-Mobile Crushing Plants, have been commissioned and are under trial operation. This is expected to augment bauxite production, facilitating higher production in M&R Complex, thereby improving profitability. **Strategic management interventions like complete stoppage of power purchase from Grid, planned reduction in use of imported coal with improvement of efficiency in fuel consumption and higher volume of Alumina production and sales, enabled us to deliver better performance, both, in financial and physical parameters.**

Our endeavour to harness **Green Energy** continued with the commissioning of second Wind Power Plant of 47.6 MW in Jaisalmer, Rajasthan, during 2013-14. The first Wind Power Plant of 50.4 MW in Andhra Pradesh, was commissioned in December 2012. On the Solar Energy front, the roof-top solar system at Corporate Office building has been commissioned. Installation of roof top solar systems at HRD Centre of Excellence, Township buildings and NALCO Research & Technology Centre (NRTC) at Bhubaneswar, are also planned in future.

Our excellent performance, despite changes in industry environment, is largely attributed to our people who have actively participated in this growth endeavour. Our initiatives to **harness human resources** through **Employee**

“ We firmly believe in conducting business that enables creation and equitable distribution of wealth through implementation of sustainable business practices with sound corporate governance. ”

Message from the CMD

Engagement and Talent Management, supplemented by conducive Management Policies, have fostered a culture of growth in togetherness. We have always focused on skill upgradation, competency building and have a well-designed succession plan. Towards this development, our colleagues put forth collective efforts through Quality Circle projects, Kaizens, Suggestion Schemes and small group activities in Energy Management. These efforts along with management initiatives have ensured continual improvements across the organisation. The industrial relations climate has been by and large peaceful, healthy and conducive because of participative management process. Our environment management processes are being strengthened and occupational health & safety is accorded a very high priority leading to **zero fatal accidents** at workplaces, for last two years.

Corporate Governance, a corner stone of our organisational philosophy, is an institutional framework with proper checks and balances to undertake, coordinate and oversee the interest of all stakeholders. Establishing and maintaining a strong culture of values & ethics, ensuring integrity and fairness in all dealings, is integral to our business practices. **Sustainable Development and Corporate Social Responsibility** are an intrinsic part of our business strategy. Through integration of sustainable

management practices and systems, we ensure creation and equitable distribution of wealth, for the betterment of all our stakeholders. Driving organisational growth & wealth creation along with protection of environment and safeguarding the interest of society around our industrial activities has always been a top priority.

Globalisation of the economy, has opened up new arenas of opportunity and challenges for industries across the world. The capability to innovate and successfully carry innovation to the market place is a crucial determinant of our global competitiveness. Considering the need to scale greater heights of corporate excellence, we continue to invest in **Research & Development and have many vertical and horizontal Growth Initiatives** planned in India & abroad. We are also in the process of formulating our new Corporate Plan which would put the Company on a growth trajectory.

As we continue to move forward on this path of sustainable development, I thank all our stakeholders & well wishers and look forward to your trust & support in creating a better tomorrow.

ANSUMAN DAS

Chairman-cum-Managing Director

National Aluminium Company Limited (NALCO) is a Navratna CPSE under the Ministry of Mines, Govt. of India. It was established on 7th January, 1981, with its registered office at Bhubaneswar. The Company is a group 'A', Central Government Public Sector, having integrated and diversified operations in mining, metal and power with sales turnover of Rs. 7024 crore in the financial year 2013-14.

NALCO is the first company in Aluminium sector in the Country to venture into International market in a big way with London Metal Exchange (LME) registration since May 1989. The Company has been listed at Bombay Stock Exchange (BSE) since 1992. All the manufacturing units and the port facility of the Company are certified to ISO 9001, ISO 14001 and OHSAS 18001 Management Systems and

Integrated Management System operates at these units. The energy intensive manufacturing units – Smelter, CPP & Alumina Refinery - are asl ISO 50001 certified for Energy Management System. All the manufacturing units and the corporate offices are also SA 8000 certified. All our units & offices are located in India.



THE ALUMINIUM GIANT

A Glimpse

NALCO Corporate Office



Bauxite Mining

On Panchpatmali hills of Koraput district in Odisha, a fully mechanised opencast mine has been in operation since November 1985, serving feedstock to Alumina Refinery at Damanjodi located on the foothills. Transportation is done through a 14.6 km long single-flight, multi-curve cable belt conveyor of 1800 TPH capacity. Capacity of the Mines is 63 lakh TPA ((as on 31.3.2014).

Alumina Refinery

The Alumina Refinery is located at Damanjodi, Odisha, approximately 14 km from the Bauxite Mine at Panchpatmali. The Alumina produced is transported to Aluminium Smelter at Angul (Odisha) and to Visakhapatnam Port by rail. The capacity of Alumina Refinery is 21 lakh TPA (as on 31.3.2014). Alumina produced is used to meet the Company's requirements for production of primary aluminium at Smelter. The surplus Alumina is exported for sale in overseas markets.



Aluminium Smelter

The 4.60 lakh TPA capacity Aluminium Smelter is located at Angul in Odisha. Alumina is converted into primary aluminium through a smelting process by using robust AP 18 smelting technology. The plant has integrated facilities for manufacturing standard & Alloy Ingot, Sow Ingots, T-ingots, Billets, Wire Rods, and Rolled products. Aluminium products are sold in the domestic market as well as exported through Kolkata, Paradeep & Visakhapatnam ports.

Captive Power Plant

Presently, the Captive thermal Power Plant has a generation capacity of 1200 MW (10 X 120 MW). The captive thermal power plant meets the power requirement of Aluminium Smelter and feeds power to the Alumina Refinery through the State Grid. The captive thermal power plant at Angul is strategically located. It gets its supply of coal from nearby Talcher Coalfields of Mahanadi Coalfields Limited.



Port Facilities

NALCO has established mechanised storage and ship handling facilities on the Inner Harbour of Visakhapatnam Port for exporting Alumina and importing Caustic Soda.

NALCO also uses the ports of Paradeep and Kolkata for export of Aluminium.

Wind Power Plants

The 1st Wind Power Plant of 50.4 MW capacity was commissioned in Gandikota, Andhra Pradesh, in December 2012 and the 2nd Wind Power Plant of 47.6 MW capacity was commissioned in Jaisalmer, Rajasthan, in January 2014. Both the plants are operational.



Rooftop Solar System

As on 31st March, 2014, NALCO is in the advance stage of commissioning a 160 KWp Rooftop Solar Power Plant at the Corporate Office in Bhubaneswar.

Registered & Corporate Office: NALCO Bhawan, P/1, Nayapalli, Bhubaneswar-751 013, India. Ph: 0674-2301988 to 2301999
Fax : 0674-2300521/2300580; E-mail: info@nalcoindia.com; Web: www.nalcoindia.com



Products

Alumina



Calcined Alumina

Alumina Hydrate



Speciality Hydrate Alumina
(Alumina Chemicals)



Aluminium Metal

Standard Ingots



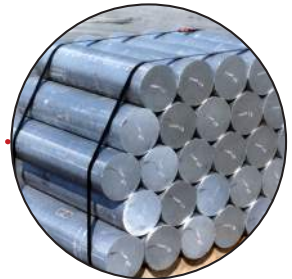
Sow Ingots

T-Ingots



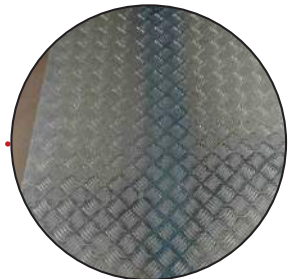
Wire Rods

Billets

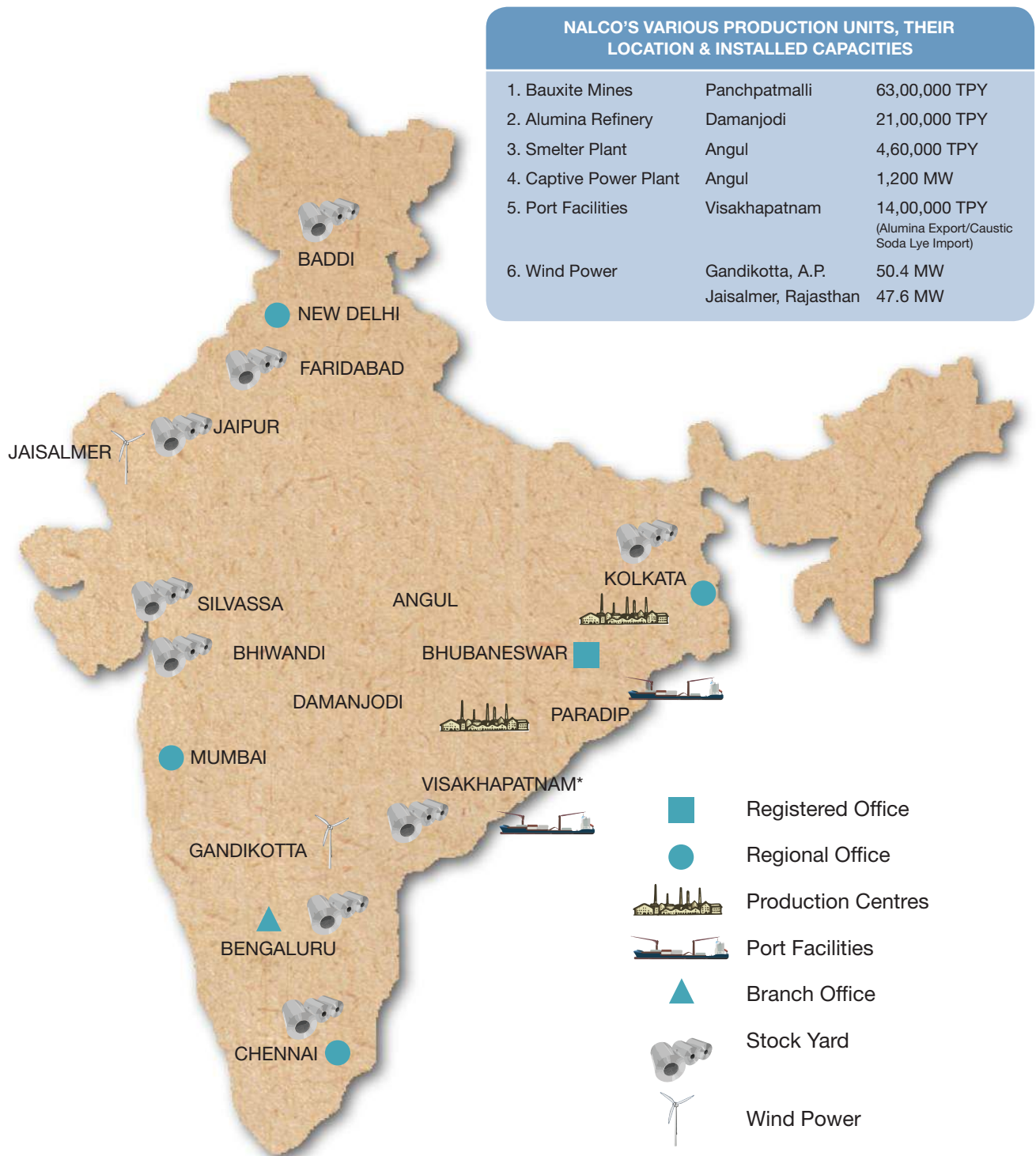


Flat Rolled Products

Chequered Sheet



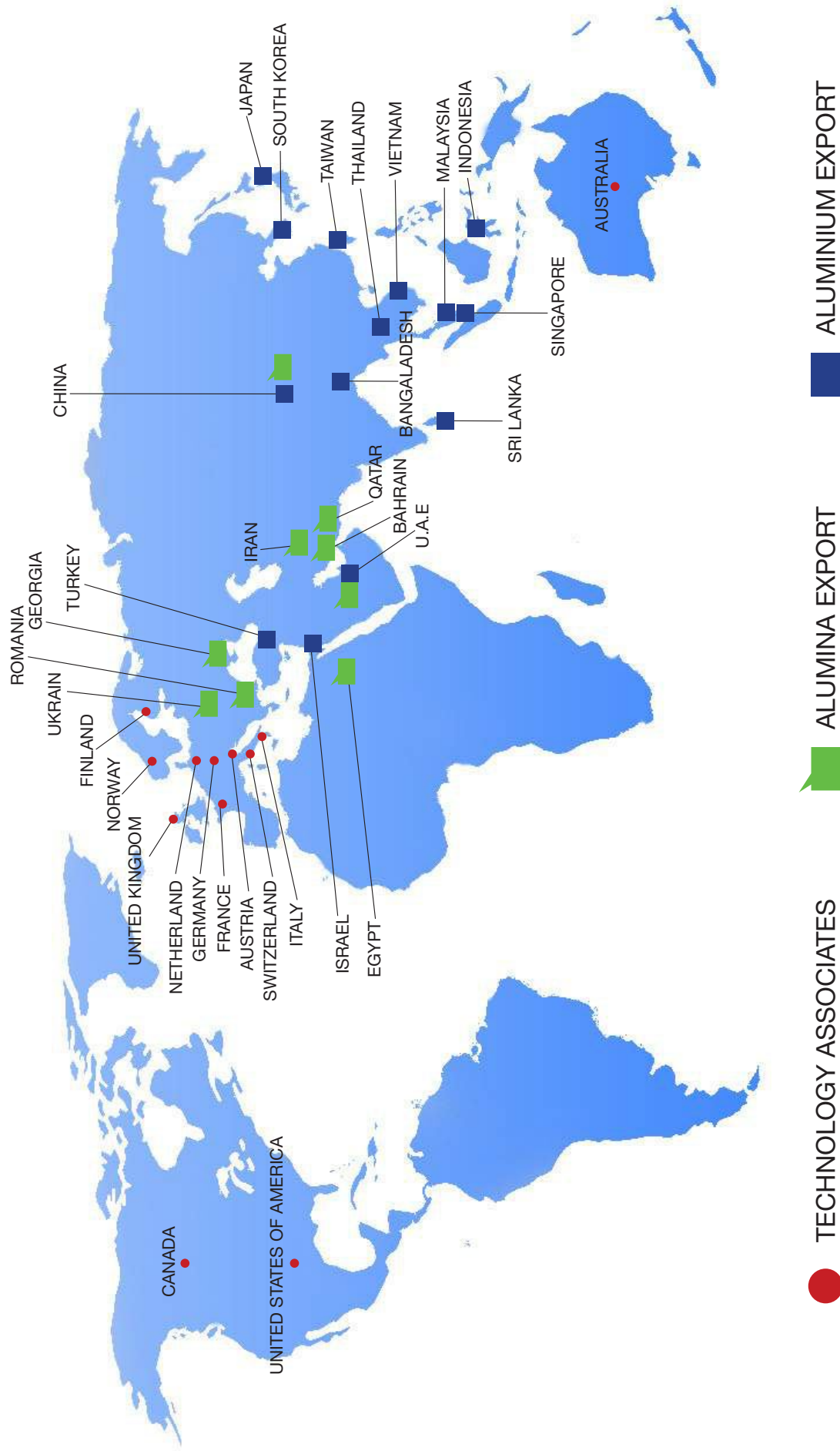
Operations & Markets served



Markets Served

Being one of the leading Alumina & Aluminium producers in the country, NALCO caters to the domestic and international demands for Alumina and Aluminium with a large customer base. Aluminium and Alumina markets served by the company (in addition to India) are depicted on the facing page. Calcined Alumina produced in excess of our own requirement is also exported.

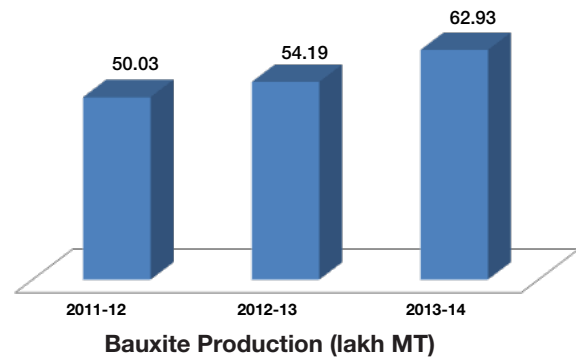
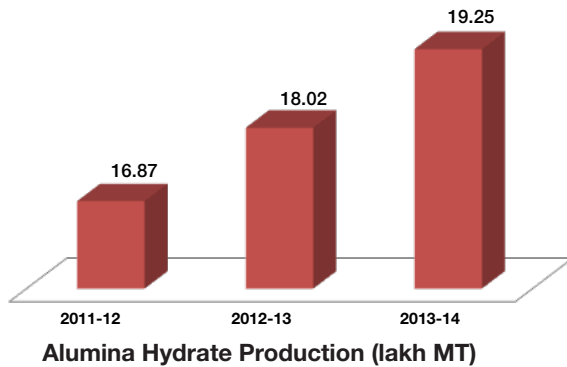
Our Global Reach



Our Performance

Bauxite Mines achieved the highest ever production since inception with transportation of 62.93 lakh MT

NALCO has witnessed strong economic growth over the past few years. 2013-14 was particularly a commendable year in terms of NALCO achieving the best performance in a few areas. Bauxite Mines achieved the highest ever production since inception with transportation of 62.93 lakh MT against previous best of 54.19 lakh MT achieved last year. Similarly, Alumina Refinery plant at Damanjodi also achieved the highest ever production with reported output of 19.25 lakh MT of Alumina Hydrate, thereby contributing to highest annual sales and export earnings figures.



Alumina Refinery achieved the highest ever production of 19.25 lakh MT

NALCO sold highest ever quantity of 13.43 lakh MT of chemicals in 2013-14 as compared to 9.85 lakh MT during 2012-13 including Calcined Alumina Export of 13.09 lakh MT during 2013-14 compared to 9.44 lakh MT during 2012-13.

The Aluminium Smelter plant at Angul produced 3.16 lakh MT of cast metal during 2013-14. Total metal sale during 2013-14 was 3.20 lakh MT. Total metal sales consists of domestic sale of 2.19 lakh MT and export sale of 1.01 lakh MT during 2013-14. The domestic sale includes 87,969 MT of wire rod which is the highest ever sale made since inception, surpassing the previous best of 79,752 MT achieved during 2012-13. However, the total metal sales during the year were lower due to production curtailment at Smelter plant.

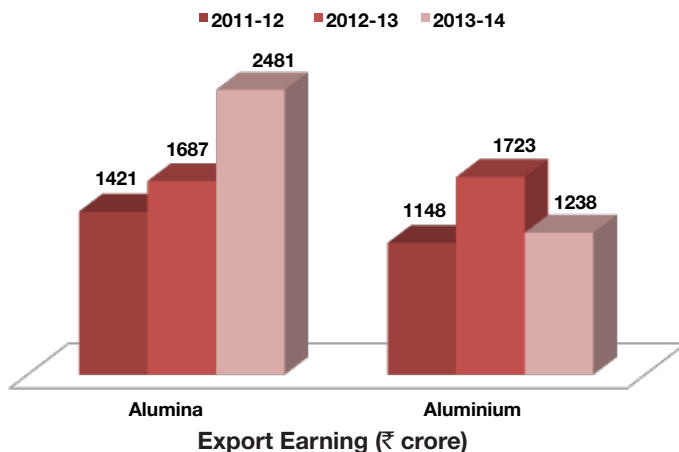
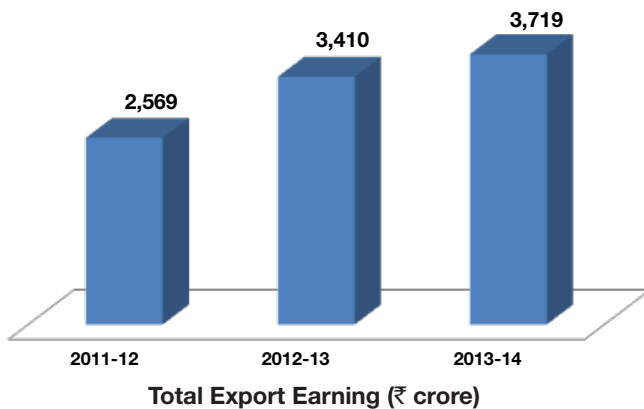
NALCO sold highest ever quantity of 13.43 lakh MT of chemicals in 2013-14

NALCO has been exporting aluminium metal and calcined alumina to various overseas destinations like Singapore, Malaysia, Korea, Japan, Turkey, Vietnam, Bangladesh, Bahrain, China, Egypt, Iran, UAE etc. Export orders are booked through e-tendering system to registered customers.

NALCO has achieved the highest ever export sales at Rs. 3719 crore during the year against earlier highest ever sale of Rs. 3410 crore during the previous



year and also generated revenue of Rs. 46.81 crore during the year under report from renewable energy against Rs. 2.64 crore revenue generated during previous year. The domestic metal sales were effected from the Smelter plant at Angul and nine stockyards at Kolkata, Baddi, Jaipur, Faridabad, Bhiwandi, Silvassa, Bengaluru, Chennai & Vizag.



NALCO has achieved the highest ever export sales at ₹ 3719 crore during 2013-14.

CPP has achieved highest ever ash utilisation of 71.67% during the year

The Captive Power Plant (CPP) at Angul has achieved highest ever ash utilisation of 71.67% during 2013-14 compared to 66% during 2012-13.

NALCO in its endeavour for green energy commissioned the 2nd Wind Power Plant of 47.6 MW in Jaisalmer, Rajasthan in Jan'14. 1st Wind Power Plant of 50.4 MW in Andhra Pradesh was commissioned in 2012-13. 144 million units of electricity was generated from these two plants during the year.

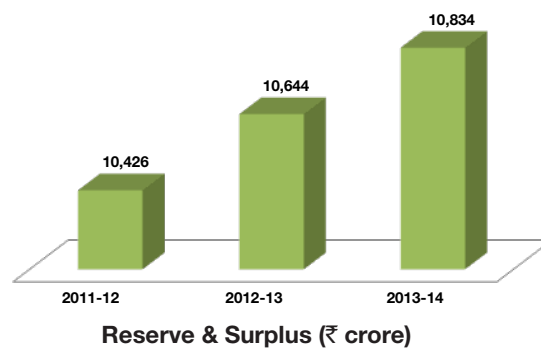
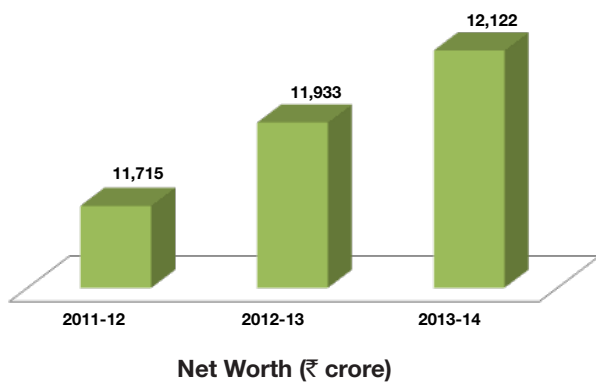
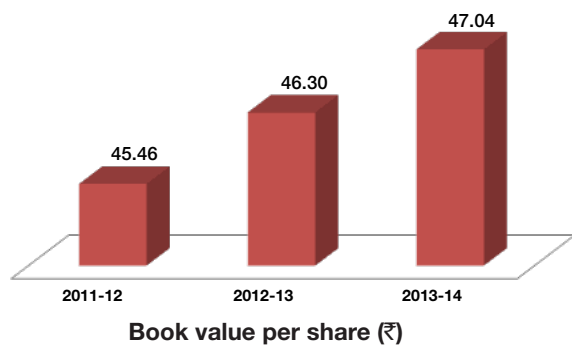
Generated revenue of ₹ 46.81 crore during 2013-14 from renewable energy.



Economic value generated & distributed, payment to government/taxes and Total Community investment is detailed in the table below:

Sl. No.	Particulars	2011-12 (₹ crore)	2012-13 (₹ crore)	2013-14 (₹ crore)
1.	Direct Economic Value Generated			
	a) Revenues from operation (includes export incentive)	6611.57	6916.48	6780.85
	b) Revenue from other sources	541.67	511.05	557.71
	Total	7153.24	7427.53	7338.56
2.	Economic Value Distributed			
	a) Operating expenses (excluding employee wages and benefits)	4899.05	5368.56	5126.05
	b) Employee wages & benefits (included in 'a' above)	1056.44	1153.93	1294.70
	c) Payment to providers of capital	257.72	322.15	386.59
	d) Payment to Government			
	(i) Corporate Tax	348.25	312.21	275.46
	(ii) Dividend Distribution Tax	41.31	53.26	65.70
	Total	6602.77	7210.11	7148.50
3.	Economic Value Retained (1-2)	550.47	217.42	190.06
4.	Additional information on Expenditures included in Operating expenses (2a above)			
	(i) CSR expenses	34.22	30.99	29.00
	(ii) Horticulture (green belts within premises and in the vicinity of the plants)	4.57	5.84	5.60
	Total community investment	38.79	36.83	34.60

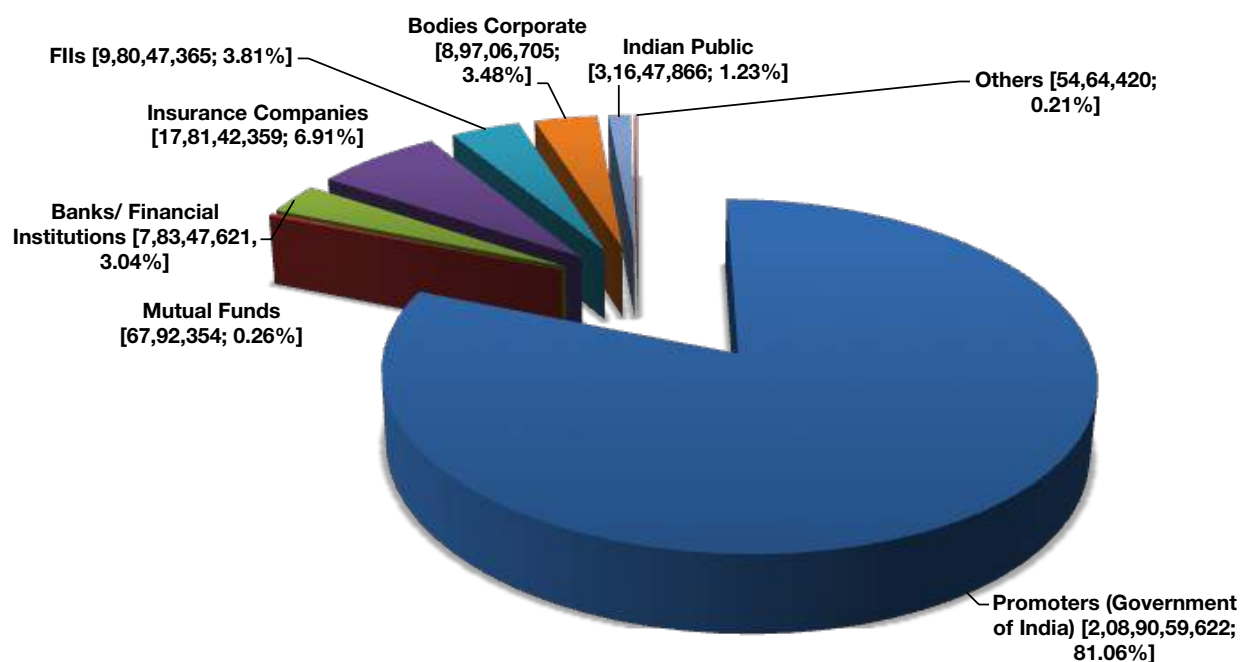
Particulars	2011-12	2012-13	2013-14
Profit Before Tax (₹ crore)	1,198	905	918
Profit After Tax (₹ crore)	850	593	642
Net Worth (₹ crore)	11,715	11,933	12,122
Return on Net Worth (%)	7.25	4.97	5.30
Book Value per share of [face value of ₹. 5/- each] (₹)	45.46	46.30	47.04
Earning per share (₹)	3.30	2.30	2.49




Shareholding Pattern

The following is the shareholding pattern of NALCO as on March 31, 2014. The Government of India holds 2,08,90,59,622 equity shares (81.06%).

Depicted as: Shareholder Name [No of shares; Percent]



DYNAMIC LEADERSHIP



NALCO has robust systems of corporate governance. The methodology is an institutional framework with proper checks and balances to undertake, co-ordinate and oversee the interest of all stakeholders. We run a two-tier system – Board of Directors and the management. The Board strives to ensure that the management is doing the best towards performance and profitability of the Company while ensuring a strong culture of value, ethics, integrity, reliability and fairness in dealing within and outside the organization. We believe in sound management, transparency and sharing all related information with its stakeholders.

Corporate Governance establishes a control system and structure to guide decision-making process to ensure high degree of accountability and credibility that focuses on building trust and confidence among all stakeholders. The corner stone of NALCO's corporate governance philosophy is anchored in the values of empowerment and accountability seeking to ensure superior "Triple Bottom Line" performance. Aspects of Integrity, Ethical practices and Transparency are enshrined in our Sustainable Development Policy. The decision making process in the Company involves procedure and Delegation of Powers (DOP) which is revised from time to time and is followed in the decision-making/approvals processes by officers of the Company for efficient conduct of day-to-day affairs of the Company.

NALCO being a legal juristic entity, the Board of Directors is entrusted with the responsibility of formulation of policies and strategies. While the full-time directors oversee the day-to-day operations and formulate long-term plans, the part-time officials and non-official directors share their wisdom and expertise in policy formulations

and strategies. The Corporate Governance practice thus brings in a blend of full time directors and independent directors on Board.

Overall management of the Company rests with the Board of Directors, the highest decision making body within the Company. The board is headed by the Chairman-cum-Managing Director (CMD), who is also the Chief Executive Officer. Since 81.06% of the equity share capital of the Company is held by the Govt. of India, NALCO is a Central Government Public Sector organisation. Therefore, the Board of Directors of the Company is also accountable to the Government of India and responsible for ensuring implementation of its policies. The primary role of the Board is that of trusteeship to protect and enhance shareholders' value. The Board oversees the Company's strategic direction, reviews corporate performance, ensures regulatory compliance and safeguards interests of shareholders. The Board ensures that the Company is managed in a manner that fulfils stakeholders' aspirations and societal expectations.

.....Top Management



R. Sridharan, IAS
Official Director



Ansuman Das
Chairman-cum-Managing Director



N.K. Singh, IFS
Official Director



N.R. Mohanty
Director (Project & Technical)



S.C. Padhy
Director (HR)



K.C. Samal
Director (Finance)



Soma Mondal
Director (Commercial)



V. Balasubramanyam
Director (Production)



P.K. Mohanty, IAS
Chief Vigilance Officer

Besides adhering to provisions of Listing Agreement, the Company also follows the Guidelines on Corporate Governance issued by Department of Public Enterprises, Government of India, from time to time. Articles of Association of the Company provides for not less than four and not more than eighteen Directors on the Board. Being a Government Company, the power to appoint directors vests with the President of India. The composition of the Board as on 31.3.2014 is as follows:

- Six full time Directors including Chairman-cum-Managing Director
- Two non-executive official directors, who were nominee directors from Government of India
- Six non-executive (Independent), non-official independent Directors who are appointed by the Government of India.

For substantial period in the year under review, there was compliance of the requirements of the Listing agreement and DPE guidelines on Corporate Governance.

The Board of Directors has also set up several Committees with specific functions and powers.

Board meetings are convened by giving at least seven days' notice in advance after obtaining approval of the Chairman of the Board/Committee. In case of exigencies or urgency, resolutions are also passed by circulation which are subsequently placed before the Board for confirmation.

Board Committees

Various committees constituted at the level of the board of Directors of the company, for various aspects of governance of the company are as follows:



CSR & SD Committee

NALCO constituted CSR & SD Committee in 2011. The present Committee comprises 2 functional directors and 2 independent directors. Director (Production) spearheads the Sustainable Development (SD) initiatives, whereas Director (HR) leads the Corporate Social Responsibility (CSR) activities. During the reporting period, the committee met once on 01.08.2013.

Risk Management Committee

NALCO has constituted a Risk Management Committee which is responsible for assisting the Board of Directors in overseeing the responsibilities with regard to the identification, evaluation and mitigation of operational, strategic and external environment risks. The Committee reviews the exceptional Risk Reports and advises remedial measures from time to time. The Risk Management Committee comprises 2 functional directors and 3 independent directors. During the reporting period, the committee met once on 27.05.2013.

As per the requirements of Listing Agreement, there should not be gap of more than four months between two Board meetings. Similarly, DPE guidelines on corporate governance for CPSEs prescribe that there should not be more than three months gap between any two Board meetings. During the financial year, Board meetings have taken place in compliance with the above. Seven Board meetings were held during the year with minimum and maximum time gap between any two Board meetings being 26 days and 78 days respectively.

Shareholders' inputs

Shareholders use every annual general meeting and extraordinary general meetings, if any, as the platform to provide suggestions and recommendations to the Board.

MoU Performance

The Company enters into a Memorandum of Understanding (MOU) with Administrative Ministry i.e. Ministry of Mines on annual basis setting targets in financial & non-financial parameters including Sustainable Development aspects.

Based on financial performance and achievement of other parameters laid down, NALCO is rated 'Very Good' as per the Memorandum of Understanding (MoU), signed by the Company with the Government of India for the Financial Year 2013-14.

Performance in respect of MOU targets, has a bearing on compensation of Top Management and Senior Managers.

Code of Conduct

Our mission statement & Code of Conduct & ethics emphasise our focus on stakeholder engagement. The company has put in place a code of conduct which addresses issues like bribery, corruption and ethics. A code of conduct for Prevention of Insider Trading is also implemented in our organisation.

Precautionary Approach

All proposed project or process is evaluated based on financial, environmental & social impacts before implementation. Environmental Impact assessments are carried out for all projects and appropriate actions are taken to mitigate the impacts, if any.



External Initiatives

NALCO engages with various other industry associations as well. We voice the risks, challenges & opportunities facing the Aluminum industry through our involvement in industry associations at policy as well as at regulatory levels. These collective platforms give us the opportunity to dialogue & evolve strategies for influencing public policies towards the benefits of the industry as well as the society at large. Various industry associations NALCO represents in, include:

- Aluminium Association of India, Bangalore
- Federation of Indian Mineral Industries (FIMI), New Delhi.
- National Safety Council, Mumbai
- Standing Conference of Public Enterprise, New Delhi.
- Confederation of Indian Industry (CII)



Note: Please refer the Company's website and the Annual Report details of the organisation structure and Corporate Governance.

COLLABORATIVE GROWTH



Stakeholder Engagement & Materiality Analysis



NALCO's Corporate Plan advocates strengthening external communication with business associates, statutory agencies and Govt. authorities in order to nurture and promote a healthy industrial relationship. Our Mission statement and Code of Conduct & ethics emphasise our focus on stakeholder engagement.

We believe that involving stakeholders in the identification of potential business risks & challenges provides us insight into our own impacts on stakeholders & vice-a-versa. Stakeholder engagement forums provide us an opportunity to have in-depth interactions based on which synergetic decisions are taken.

To interact with relevant stakeholders, it is important to identify & prioritise stakeholders. This is done through internal discussions which are distilled further based on the probable impact intensity on each other. High impact stakeholders include customers, employees, government, regulatory authorities, investors & shareholders, industry associations, civil society organisations and suppliers & vendors, and are consulted for mapping the sustainability issues.

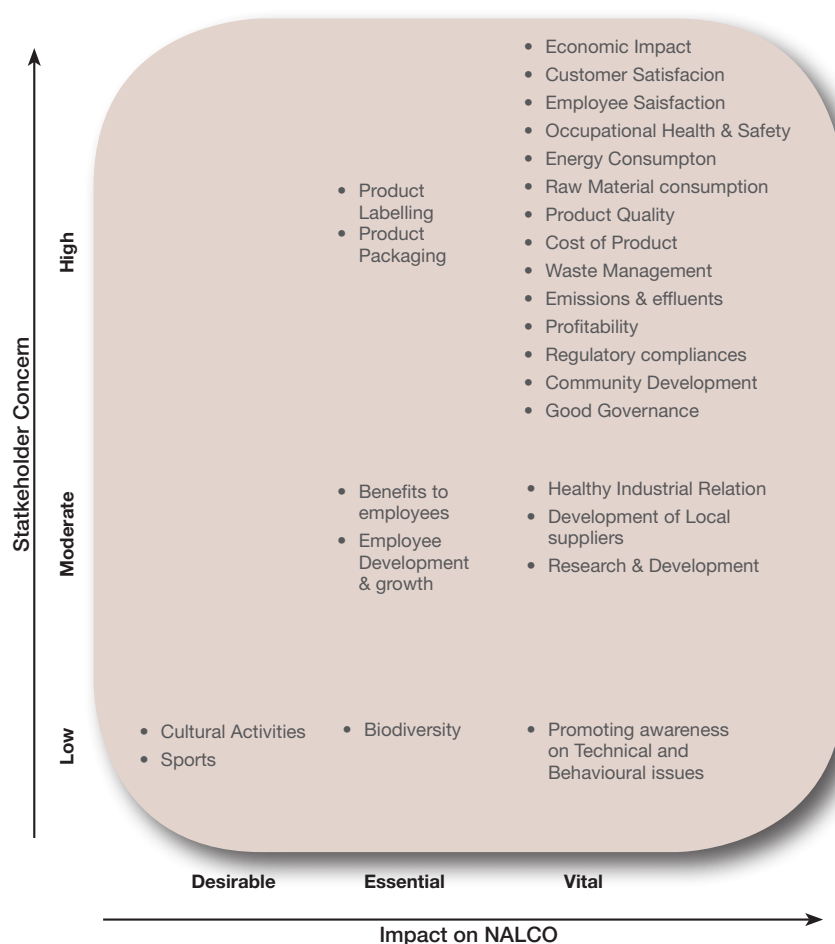
The engagement is done formally through structured forums like vendors & suppliers meet, interactions with customers, meeting with shareholders & investors and informally through active involvement in industry associations. These formal & informal ways of capturing concerns of our stakeholders helps us understand their perspectives.

Over the years, these interactions have broadened our understanding resulting in the formulation of appropriate policies and procedures to address their concerns. Additionally, providing our perspective to stakeholders enhances our brand image and contributes to our long-term success.

Discussions within the management and with employees help identify critical business issues which are then subjected to review by the top management. Based on engagement with external stakeholders and interactions/discussions with internal stakeholders, material issues are identified and discussed in detail. They range from environmental parameters like waste, energy, employee health & safety to community & local suppliers development.

We have developed a materiality matrix providing a concise mapping of the identified sustainability issues in terms of high or low impact to NALCO's business.

Materiality Analysis Matrix



Our detailed stakeholder engagement plan is given below:

Stakeholder	Relevance to Business	Mode of Engagement & Frequency	Stakeholders' Concerns & Issues	Response to Stakeholders' Concerns & Issues
Government & Regulatory Authorities	<ul style="list-style-type: none"> Important from viewpoint of legislation, Taxation consents, renewals, compliances. Moreover, shareholding of Government of India is 81.06%. Consequently, business sustainability is also significantly influenced by the authorities 	<ul style="list-style-type: none"> Structured communication on performance, social issues, peripheral development work Regular meetings & communication Structured communication regarding compliance with various regulations. 	<ul style="list-style-type: none"> Local developmental priorities and Infrastructure development CSR activities Forest & Environmental compliance Other applicable acts like Factory and Boiler regulations, Mines and mineral conservation act, Factory act etc Profitability & Dividend 	<ul style="list-style-type: none"> MoU with the Ministry of Mines Periodic government submissions Meetings with Govt Parliamentary Committee visits District administration on peripheral development work Annual reports and regulatory filings Supporting visits as required by regulatory authorities to plants, units, offices
Investors & shareholders	<ul style="list-style-type: none"> Capital structure, availability of fund & working capital 	<ul style="list-style-type: none"> Regular interactions with financial institutions, shareholders as per statutory need Communications/ sharing information with share holders/ investors on all key concerns including regarding grievance, if any 	<ul style="list-style-type: none"> Economic performance of the organization Dividend, results and other issues Grievance resolution 	<ul style="list-style-type: none"> Analyst meet & conference calls with analysts Analyst briefings Quarterly results Annual general meeting Annual report Press releases Website updates Shareholder's grievance committee Compliance to SEBI Guideline
Employees	<ul style="list-style-type: none"> Employees are the biggest asset and significantly impact sustainability of organisation, in achieving planned results, effectively and efficiently 	<ul style="list-style-type: none"> Regular Communication to employees on all key concerns including grievance, if any. Interactions with unions, association Notice, Circular, Office order etc 	<ul style="list-style-type: none"> Employee benefits and compensation Performance management and recognition Employee grooming and development 	<ul style="list-style-type: none"> Bulletin boards Newsletters, mailers Grievance redressal mechanism Employee committees Intranet portal Periodic meetings with officer's association Meeting with workmen unions
Customers & Consumers	<ul style="list-style-type: none"> Purchase decisions by them regarding our products is vital for organisation's business sustainability 	<ul style="list-style-type: none"> Information sharing through frequent interactions and periodic surveys over the year. 	<ul style="list-style-type: none"> Product quality, cost, and delivery Product performance including environmental aspects Customer satisfaction Customer complaint resolution 	<ul style="list-style-type: none"> Product information through website. Biennial customer satisfaction surveys Customer complaint resolution system In person customer facility visits and engagements to jointly address any technical issues, as and when necessary

Stakeholder	Relevance to Business	Mode of Engagement & Frequency	Stakeholders' Concerns & Issues	Response to Stakeholders' Concerns & Issues
Suppliers & Vendors	<ul style="list-style-type: none"> Availability & Supply of raw material & other services to NALCO, which in turn affects their economic sustenance 	<ul style="list-style-type: none"> Sharing information with vendors Vendor Development Improvement of the vendor capability 	<ul style="list-style-type: none"> Anti-corruption practices Quality of goods and services Process of adopting integrity pact programme Technical assistance for product development 	<ul style="list-style-type: none"> National level vendor development programme and annual exhibition cum buyer-seller meet Participation in exhibitions organised by industry associations, state government Plant level sub-committee meet at Angul & Damanjodi Plant level advisory committee meeting at Bhubaneswar Facility to MSE Units
Community/ civil society organisations	<ul style="list-style-type: none"> They are the major stakeholders as they provide social license to operate. 	<ul style="list-style-type: none"> Regular interactions for need assessment and sharing information on the performance. 	<ul style="list-style-type: none"> Community needs on infrastructure, education and health, Community, environmental and social impacts Rehabilitation of land affected persons 	<ul style="list-style-type: none"> Operating mobile health units for periphery villages and organising health camps in periphery villages Sponsoring children from periphery villages of Damanjodi for formal education Water and energy study in periphery villages of Damanjodi Different schemes for rehabilitation of persons contributing land for project
Industry Associations & local industries	<ul style="list-style-type: none"> These associations bring the various developments taking place at the government level to gain perspective on same and share it with the concerned authorities. They help express our viewpoints at various platforms thereby helping us to contribute as active stakeholders in different policies formulation 	<ul style="list-style-type: none"> Regular interactions on common issues for shaping/ influencing policy matters Healthy Competition within the industry sharing of information & learning 	<ul style="list-style-type: none"> Policy issues Technological developments Market Share 	<ul style="list-style-type: none"> Participation in developing industry and issue centric programmes and action plans as member of the CII, Utkal Chambers of Commerce and Aluminium Association of India All Odisha QC Convention
Other service providers	<ul style="list-style-type: none"> For achieving planned results 	<ul style="list-style-type: none"> Sharing information with job contractors & workers engaged by them. Improvement of their competence/ capability 	<ul style="list-style-type: none"> Fair treatment & non discrimination Health and safety at workplace Working hours and overtime (wages) 	<ul style="list-style-type: none"> On the job counselling and feedback Trainings during induction Tool box talk Meetings

..... Our Sustainability Aspects

Our sustainability strategy is translated in the way we conduct our businesses, our approach to stakeholder concerns, our transparent governance structure, develop our human assets, manage environmental concerns and in our contribution towards sustainable growth of our neighbouring communities.

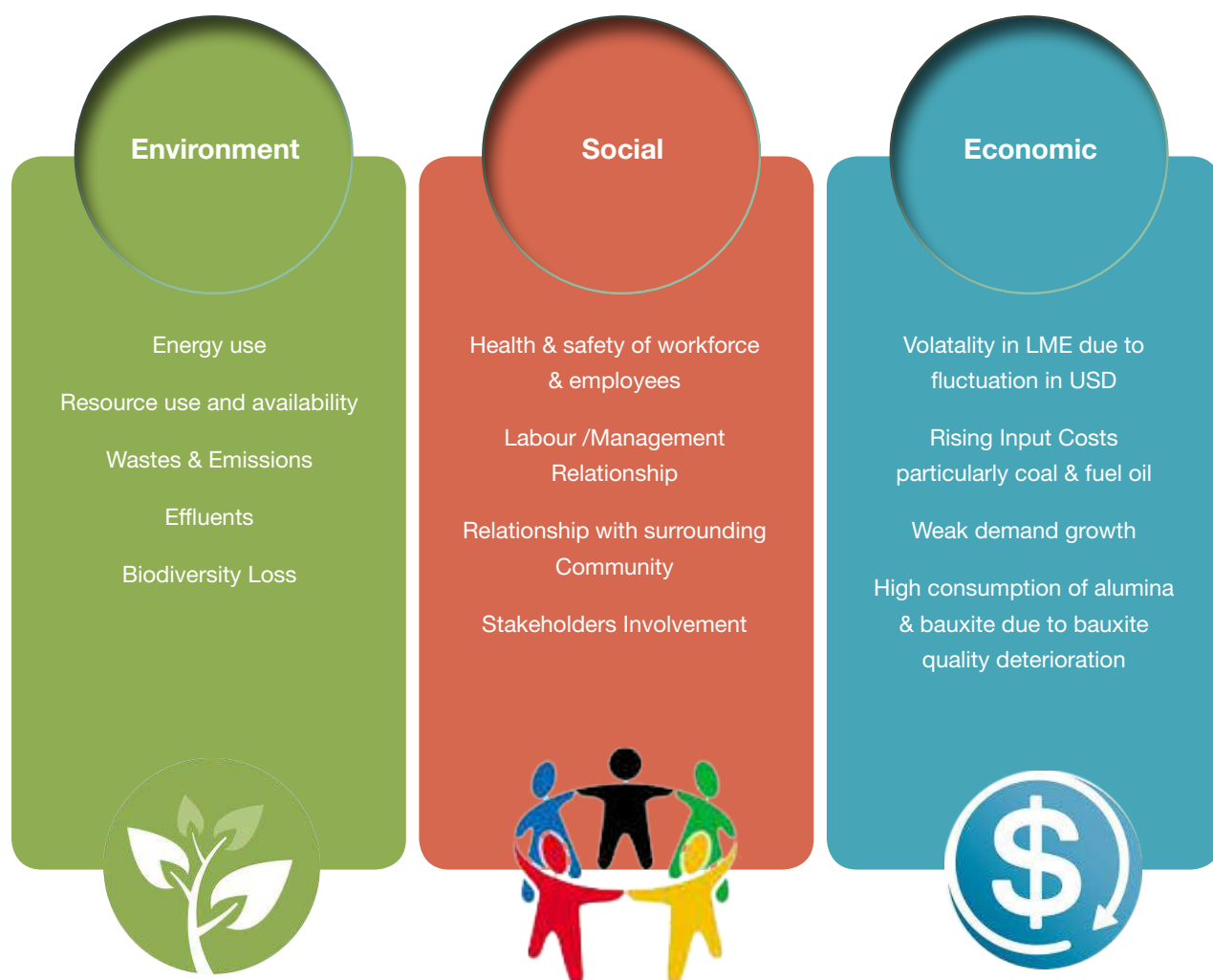
For us, sustainability commitments mean that we remain engaged in the positive cycle of setting goals and demonstrating results across the three 'Ps': Planet, People and Profit.

Planet: Through optimal utilisation of energy sources, elimination of waste, adoption of greener processes, development of greener products, adherence to best practices and compliance with emerging international standards, we ensure that along with a robust business

performance, our planet too remains in good health.

People: We appreciate the value of our most valuable assets, both within our operations and among our communities. Ensuring safety and providing growth opportunities for our employees, being alert to the needs of the local communities, addressing healthcare and empowering the youth through training and employment are key to becoming a truly sustainable organisation. This has been our philosophy for the last three decades and will remain so in the future.

Profit: Economic sustainability is best proven through performance. A business portfolio that covers core sectors, a rapidly growing order book and strategic investments in sunrise industries will continue to fuel our growth trajectory in the years ahead.



Key Sustainability Targets and Performance

Priority Aspects	Business Risk	Key stakeholders	Target Set in 2013-14	Key Results Achieved
Economic	Falling Price of Aluminium	<ul style="list-style-type: none"> • Employees • Shareholders 	Added Value/Gross Sales: 4.36%	Added Value/Gross Sales: 5.78%
			Net Profit/Net Worth: 5.34%	Net Profit/Net Worth: 5.57%
			Gross Profit/Capital Employed: 8.35%	Gross Profit/Capital Employed: 8.89%
	Material Conservation	<ul style="list-style-type: none"> • Community • Government • Customers • NGOs 	Aluminium Fluoride consumption at Smelter: 22 KG/MT Lime consumption at Alumina Refinery: 34 KG/MT	Aluminium Fluoride consumption at Smelter: 18 KG/MT Lime consumption at Alumina Refinery: 31.5 KG/MT
Environment	Energy Efficiency	<ul style="list-style-type: none"> • NGOs • Community • Government 	DC Power consumption at Smelter: 13,500 KWHr/MT Alumina Refinery certification audit for Energy Management System (ISO 50001) by February'2014	DC Power consumption at Smelter: 13,408 KWHr/MT Certification Audit completed in January 2014
	Water Management	<ul style="list-style-type: none"> • NGOs • Community • Government 	One more Rain Water Harvesting System to be installed at Mines	Project progress is as per schedule
	Carbon Consumption	<ul style="list-style-type: none"> • Community • Government • Customers • NGOs 	Net carbon consumption: 440 KG/MT of hot metal	Net carbon consumption: 431 KG/MT of hot metal
	Waste Management	<ul style="list-style-type: none"> • NGOs • Community • Government 	Fly ash utilisation at CPP: 70%	Fly ash utilisation at CPP: 71.6%
	Reduction in Carbon Dioxide emission	<ul style="list-style-type: none"> • Community • Government • Customers • NGOs 	Operate Pilot Project for Carbon Sequestration by Algae formation in CPP	<ul style="list-style-type: none"> • Operation Commenced • Target achieved
Labour Practices	Safety	<ul style="list-style-type: none"> • Employees 	Zero fatalities amongst Employees as well as contractors	Zero fatalities in all our operations
	Employee Satisfaction and Retention	<ul style="list-style-type: none"> • Employees 	Attrition Rate: less than 2%	Attrition Rate: 0.1%
Human Rights	SA 8000 Compliance	<ul style="list-style-type: none"> • Employees • Contractor • Workers • Community 	All manufacturing units to obtain SA 8000 re-certification	All manufacturing units re-certified
Social	Community Development	<ul style="list-style-type: none"> • Community • Employees • Suppliers 	CSR Expenditure: 1.3% of PAT	CSR Expenditure: 5.24% of PAT
			Provide formal education to 200 tribal children at different schools in Damanjodi	254 children benefitted
Product Responsibility	Customer Satisfaction	<ul style="list-style-type: none"> • Customers 	Percentage achievement of targetted Customer Satisfaction Index: 87%	Achieved 100%
	Innovation in product quality and services	<ul style="list-style-type: none"> • Employees • Customers • Suppliers 	R&D expenditure: 1% of PAT	Actual R&D expenses incurred: Rs. 1387 lakhs (2.16% of PAT)







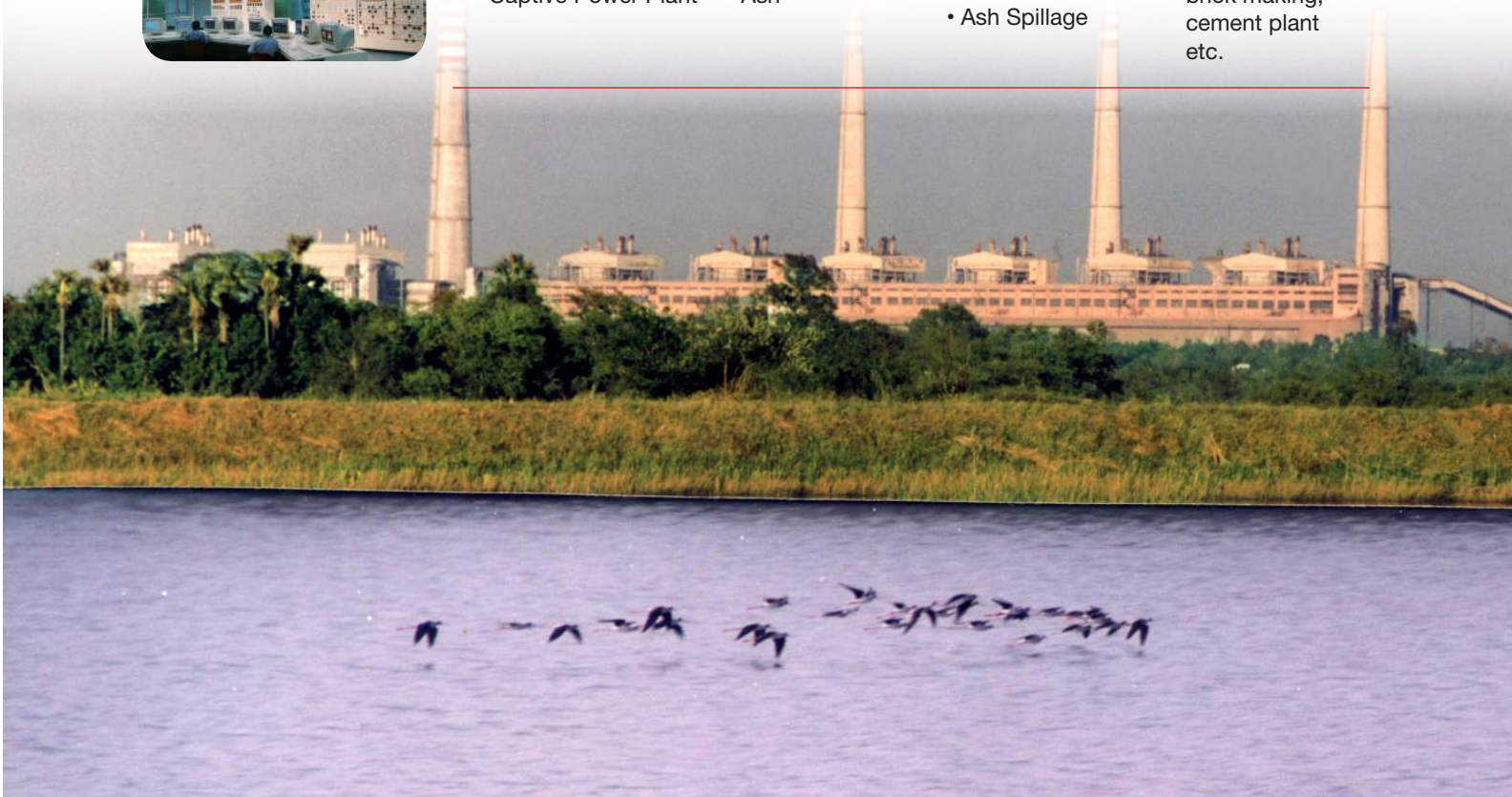
ENVIRONMENTAL STEWARDSHIP

Robust environmental management practices are adopted in the organization in consonance with our core operational philosophy.

Environment Impact Assessment was carried out for all the operating units, to anticipate any negative impacts on the environment and local community, resultant from our operations. We are committed to minimize our environmental footprints from the stage of commencement of operations to the post-closure stage. All unit operations are equipped with the relevant equipment at the project stage to prevent pollution and control impacts within the prescribed standard. Review of environment impacts arising out of key business activities are done every year and steps are taken to mitigate the identified impacts. This serves as a basis for various environmental initiatives taken up at units.

The Sustainable Development Policy emphasizes specific focus on Environment and Energy related issues, with well formulated Environment policy and Energy policy. Environment and Energy Management systems are implemented at units, which demonstrate the consciousness and sense of responsibility towards environment and energy management. All the production units and the Port Facility at Vizag are certified to ISO 14001 while the Captive Power Plant and Alumina Refinery are certified to ISO 50001 standard. As on March 2014, ISO 50001 system is also being implemented in Smelter and the Certification of the unit is planned in 2014-15. There were no significant fines imposed on NALCO for non-compliance with Environmental Law. Environmental concerns related to our units and operations are as follows:

Units	Environmental concerns	Risk	Opportunity
	<ul style="list-style-type: none"> • Dust • Noise 	<ul style="list-style-type: none"> • Air Pollution • Noise Pollution 	<ul style="list-style-type: none"> • Afforestation in Mined out areas
	<ul style="list-style-type: none"> • Caustic • Redmud • Fly Ash 	<ul style="list-style-type: none"> • Caustic spillover • Air pollution • Ash spillage 	<ul style="list-style-type: none"> • Utilising waste like redmud, fly ash
	<ul style="list-style-type: none"> • Fluoride emission • Waste like spent potline 	<ul style="list-style-type: none"> • Fluoride contamination 	<ul style="list-style-type: none"> • Spent potline utilization in Cement industry
	<ul style="list-style-type: none"> • Ash 	<ul style="list-style-type: none"> • Air Pollution • Ash Spillage 	<ul style="list-style-type: none"> • Fly ash utilization in brick making, cement plant etc.



Energy & Emissions

Aluminium being an excellent metal, owing to its versatile metallic properties, has found varied industrial applications. However, production of aluminium is an energy intensive process. In the Perform, Achieve & Trade (PAT) scheme of Government of India, Aluminium is identified as one of the eight energy intensive sectors. The Alumina Refinery & the Smelter and Power Complex of our organization are the two Designated Consumers in the Aluminium Sector, with assigned target of reducing specific energy consumption by 5.54% and 5.024%, respectively. Plans towards energy conservation through specific initiatives, regular equipment maintenance & use of alternative source of energy are under implementation. A dedicated energy policy governs the various actions taken on the energy front, consistently striving to reduce energy consumption and create opportunities to achieve the set targets.

Major energy requirements in the organisation are primarily met through electricity generated in the Captive Power Plants and purchases from the State Grid. The consumption of direct & indirect energy has increased over the past few years due to project commissioning activities, trial operations at the units. However, efforts have been made by different units to reduce the consumption by way of technology upgradation, use of energy efficient technologies and behavioural changes.

During 2013-14, total direct and indirect energy consumption stood at 3,17,688.3 TJ and 18.8 TJ respectively. Attributed to the use of fossil fuels such as coal and heavy fuel oil, the direct greenhouse gas emission in the reporting period was 26 million tonnes of CO₂ & 4,073 Ton due to electricity consumption (calculated using the emissions factors published by the Central Electricity Authority of India).

Apart from GHG emissions, other emissions like NO_x, SO_x, etc, generated by the operations are within the permissible limits prescribed by CPCB/ SPCB. The environmental statement containing such information is submitted to regulatory authority every year. One show-cause notice was issued on 21.03.2014 by Odisha State Pollution Control Board and was pending as on 31.03.2014. Necessary action for quickly resolving the same was taken and the issue got finally resolved in the next quarter. During 2013-14, NALCO has spent Rs. 2.62 crore towards environment management, compared to Rs.1.15 crore spent in 2012-13.

NALCO's smelting operation consumed 732 kg of R-22 refrigerant gas (ODS) & 526 kg of R-124 gas and mining used 37 kg of R-22 gas (ODS) to make up for the leakages. The smelter operations lead to the release of perchlorofluorocarbon emitting 98.74 tonnes of CF₄ as against 126* tonnes during 2012-13 and 12.74 tonnes of C₂F₆ during 2013-14 against total emission of 16.17 tonnes during 2012-13.

Energy Consumption

Direct Energy Consumption (GJ)	FY 2011-12	FY 2012-13	FY 2013-14
HFO	80,95,025	78,83,046	72,00,188
LPG	9,604	7,867	4,845
LDO	3,97,247	2,42,571	1,05,715
Diesel	410,348	4,32,712	2,38,713
Coal	1,08,908,673	11,10,87,048	9,92,96,324
Indirect Energy Consumption (GJ)	7,39,674	6,50,171	19,495
TOTAL Energy Consumption (TJ)	1,18,561	1,20,304	1,06,865

GHG Emissions (in Tonnes) - Scope 1 & 2

Fuels Consumed	FY 2011-12	FY 2012-13	FY 2013-14
HFO	6,26,555	6,10,147	5,57,295
LPG	606	496	305
LDO	29,436	17,974	7,833
Diesel	30,406	32,064	17,689
Coal	1,07,05,722	1,09,19,857	97,60,829
Electricity	1,60,262	1,40,870	4,224
TOTAL	1,15,52,987	1,17,21,408	1,03,48,175

* Restatement of the data provided for 2012-13 in the previous sustainability report.

Few initiatives taken during the FY 2013-14:

1. Alumina Refinery

- The seven-stage Boiler Feed Pump (BFP) has been replaced with the energy efficient six-stage BFP in Boiler-1, resulting in energy savings of 5,56,800 KWHr per annum.
- Automatic Imported Coal blending system has been successfully commissioned in Coal Handling Plant (CHP) for blending imported coal of higher Gross Caloric Value(GCV) with indigenous coal.
- The old Plate Heat Exchanger (PHE) has been successfully replaced with the 35% increased capacity PHE of Model M30. Apart from increase of throughput, this new type of PHE derives the benefit of Energy conservation, reduction in Heat load in cooling tower by eliminating the water PHE pack.

Total Energy saved with implementation of 15 such initiatives has resulted in energy savings of 355,901,260 KWHr with reduction in Green House Gas (GHG) emission of about 277,603 MT.

2. Smelter Plant

- Reduction in specific DC energy consumption in Smelter was achieved by commissioning of ALPSYS Pot regulation system in Pot Line-1, reducing anodic problems, use of graphitized cathode block, use of slotted anodes and increasing Anode stub hole and pin length in running pots. All these activities have resulted in total annual energy savings of 86,00,688 KWHr, with reduction in GHG emission of approximately 6708.55 MT.
- The Specific fuel oil consumption was an all time best of 57 Lt/MT of cast metal during 2013-14 against a budgeted target for specific fuel oil consumption of 69 Lt/MT cast metal. This was achieved by optimizing the furnace operation as per market demand thereby reducing furnace idling time, semi-automatic firing with PID controller for optimum firing in furnaces, ensuring proper atomization & combustion in the furnaces, resulting in total oil savings of 3,797.9 KL with reduction in GHG emission of approximately 11,813,MT.
- Smelter has taken up ten PAT projects (Perform, Achieve & Trade) to achieve the PAT target assigned by BEE. Out of ten PAT projects, three projects are completed contributing to reduction in Specific fuel oil consumption & electrical energy.

3. Captive Power Plant

- The fuel oil consumption in CPP has reduced from 19,822 KL to 5,084 KL, thereby resulting in savings of 14,739 KL of fuel oil, with reduction in GHG emission of approx. 45,845 MT.
- Four 900 KW old type PA fans motors were replaced with energy efficient PA fan motors (BHEL make) for improving reliability and reducing energy consumption.

4. Bauxite Mines

- Load sharing of capacities of the existing three transformers (33/0.433 KV 1250MVA) to have optimum loading.
- Modification of sump height of sprinkling pump house for haul roads.
- Installation of ten 36W LED-based solar street light poles.

The above initiatives have resulted in energy savings of 30,636 KWHr per Annum with reduction in GHG emission of approximately 23.30 Ton.





Towards Clean Energy

As a responsible corporate citizen, NALCO has been progressively moving towards use of renewable energy. As per the provisions of Odisha Electricity Regulatory Commission (OERC) notification, NALCO, being a Public sector entity has the obligation to generate 6% (previous year 5.5%) of its total consumption from renewable sources comprising of 4.20% (previous year 3.95%) from co-generation, 0.20% (previous year 0.15%) from solar renewable source and 1.60% (previous year 1.40%) from non-solar renewable source.

A Wind Power Project of 50.4 MW at Gandikota, Andhra Pradesh has obtained Host Country Approval (HCA) from National CDM authority, Ministry of Environment and Forest, Govt. of India. On an average, 87,000 tons of CO₂ equivalent (GHG emission) is estimated to be reduced annually. NALCO has also commissioned a 2nd Wind Power Project of 47.6 MW capacity in Jaisalmer, Rajasthan, which is awaiting host country approval from National CDM authority.

One 160 KWp Roof Top Solar Power Plant at the Corporate Office, Bhubaneswar is in commissioning stage. Installation of roof top solar system in township buildings is planned.

NALCO has fulfilled the requirement of its co-generation obligation for the year 2013-14 through co-generation of power from Steam & Power Plant at the refinery unit. Through complete commissioning and generation of wind power at Gandikota (AP) and Jaisalmer (Rajsthan) the company has fulfilled its Non solar obligation (through wind power generation) for the current year and part obligation for previous years. Cumulative Non solar REC obligation as on 31.3.2014 is Rs. 15.54 crore towards 1,03,656 Non-solar RECs. Due to non-fulfilment of the obligation to generate power from renewable Solar source, the company as on 31.3.2014, has a cumulative liability for Rs. 24.98 crore towards 26,855 Solar RECs.

Water Management

Availability of water for industrial use has been a matter of great concern across the globe. Water, considered as strategic resource in our organization, is managed through a systematic approach to reduce, recycle and reuse the resource. All our production units source surface water from nearby streams or rivers within the permissible limit without significantly affecting any water body.

Our total water consumption for 2013-14 has been 44.83 million cu.m. out of which surface water accounts for major consumption (44.76 cu. m). From the water drawn from river Bramhani, a part is distributed to nearby villages through Rural Water Supply Scheme. During 2013-14, 6,26,662 M³ water was supplied to near-by villages.

Unit	Source of Water	Surface Water Withdrawal (in M ₃)	
		2012-13	2013-14
Mines	Jholaguda Stream	5,29,239	5,44,905
Alumina Refinery	Kerandi River	90,16,235	94,65,271
Smelter & CPP	Brahmani River	4,27,73,970	3,47,58,550
Total Withdrawal of Surface Water		5,23,19,444	4,47,68,726

Total volume of water drawal (m³/year) from Sources during 2013-14

Surface water (river, streams etc.)	44768726
Municipal water/ Other water supply	10990
Rain water	58893
Total	44838609

Our water conservation and reuse efforts have been noteworthy, with important contributions in all our production units. Zero discharge industrial and domestic effluent / Sewage treatment plants operate across all the manufacturing units & townships. Treated industrial effluent and treated domestic water is recycled and used for different processes, horticulture and irrigation. We maintain Zero Discharge at all our units. Our total water consumption has gone down by 7.5 million cu.m. during 2013-14.

Initiatives in Water Management

Sludge Pond Recovering system	<ul style="list-style-type: none"> In the sludge pond recovering system, sludge, grit consisting of sand, gravel, or heavy solids are allowed to settle and around 270-290 m³ per day (depending on seasons) of water is recovered and sent to the raw water reservoir.
Sewage Treatment Plants	<ul style="list-style-type: none"> Treated sewage water is reused for gardening and maintaining green belts. This reduces the use of raw water from the river. The residue is used for land filling and as manure. In the reporting year 148,920 M³ of sewerage water was recovered from S&P sewerage treatment plant.
Ash pond Recycle System	<ul style="list-style-type: none"> From CPP ash-pond 1,27,85,068 M³ & SPP ash-pond 80,72,604 M³ water was recycled during the reporting period.
Industrial Drain Water Recycling System (IDWRS)	<ul style="list-style-type: none"> IDWRS has been designed to treat all liquid effluents which originate within the industry. In the reporting period, 9,84,000 M³ from CPP, 76,650 M³ from mines & 3,24,120 M³ from smelter IDWRS was recovered & utilized in processes.
Ground Water Charging	<ul style="list-style-type: none"> A recharge pond is made at CPP to charge the ground water. The rain water harvesting systems of township charge the ground water.
Rain Water Harvesting	<ul style="list-style-type: none"> At our captive power plant, a catchment area of 2,500 sq. m. has been made to harvest the rainwater. Also at the RCPH, a catchment area of 1,250 sq. m. harvests the rainwater. Similar programmes are also being taken for other plant buildings. During the reporting year, we have harvested about 3,012 M³ at CPP & 55,881 M³ at Panchpatmali Bauxite Mines. At smelter plant, there is a rainwater holding pool of 80,000 m³ capacity which is treated and used in the plant operations.
Facilities' Water Usage	<ul style="list-style-type: none"> We have installed sensor-based low flow type water taps in toilets We regularly check pipe lines and valves for any leakages and faults
Minimizing Water pollution	<ul style="list-style-type: none"> Smelter does not have any process water. However, when the water running in surface water drains as well as the rain water comes in contact with fluoride-bearing material lying on the ground during transportation, the water gets contaminated with fluoride. We have installed a modern de-fluoridation plant using ion-exchange technology to remove fluoride from waste water.

Waste Management

NALCO is very conscious of the need to conserve natural resources because of various reasons, the major being our own dependence on the availability of these natural resources for our very survival. Wherever possible, we apply 3Rs approach of – Reduce, Reuse & Recycle. Despite, all the efforts, it is quite expected that lot of wastes are generated in the process.

The mining of bauxite ore & its further produce – Alumina & Aluminium – generates various kinds of by-products, hazardous and non hazardous wastes like used oil, spent resin, fly ash and ETP sludge. Waste management plans have been put in place at all units of operations to effectively manage the generated waste. We explore the possibilities of not only disposing off the waste in an environmental friendly way but also try to minimize the waste generated by adopting reduce and recycle technology wherever possible.

Out of all the wastes generated the most crucial for the Aluminium industry is Red Mud primarily because of

the quantity and secondly because of its highly alkaline nature. During cleaning of bauxite ore in refinery huge quantity of red mud is generated. We apply the cleaning method which helps us reclaim sodium oxide from the water collected from the red mud pond to be utilised in the process again. The level of red mud is maintained in the pond so as to avoid any soil contamination due to overspill. Also, the fly ash generated as another major waste is used for manufacturing ash bricks which are thereafter used in the construction around NALCO sites. The contracts for the same are awarded to local people to provide livelihood opportunities.

During the reporting period 4,563 MT of aluminium scrap has been used in the process. Also, 1.18 MT of anode produced during the electrolysis of aluminium has been recycled in the process.

The wastes generated along with their disposal techniques are mentioned in the table below:

Non-Hazardous Wastes

Alumina Refinery	Lime Grit	18468 MT	Low lying area filling
	Fly Ash	596876 MT	415663 MT reused & rest dumped at ash pond
	Empty Bags	1294300 Nos	Sold through central store
	Empty Containers	1723 Nos	Cleaned and sold through central store
Smelter	Metalic Scrap	1871 MT	Reuse/ Selling
	Mixed Debris	2160 MT	Used as land fill
	Refractory Bricks	1718.23 MT	Reused in construction of temp. resistant floor
CPP	Fly Ash	1921804 MT	out of 1921804 Mt of ash generated 544443 Mt is disposed to ash pond rest was utilized, e 71.67% of ash was utilized
Mines	Over Burden	2283650 MT	Reused in backfilling of mined out area



Waste management system set up in the corporate township at Damanjodi that involves primary collection door-to-door, secondary transport of waste to a composting and landfilling site as well as management of aerobic composting facilities.



FlyAsh bricks used for construction

Hazardous Wastes

	Description of Waste	Quantity generated	Management
Alumina Refinery	Red mud	2758567 MT	Disposed to redmud pond
	Spent Resin	10.5 MT	Disposed in secured land fill
	ETP Sludge	5882 MT	Disposed to redmud pond
	Used Oil	85.62 KL	Sold to authorized recycler
	Discarded Asbestos	1400 SqM	Dumped in specified pits
Smelter	Aluminium Dross	4660.37MT	Recycled in the process
	Cathode Residue	2091 MT	Stored in secured land fills
	Spent Anode	51045 MT	100% recycled in anode making
	Rejected Filter Bags	6.612 MT	Incinerated in pot
	Rejected ALF3 Bags	96955 Nos	Incinerated in pot
CPP	Used Oil	852.118 KL	Sold to authorized recycler
	Used Oil	25.72 KL	Sold to authorized recycler
	Spent Resins	2.9 KL	Disposed in secured land fill
Mines	Used Oil	82.78 KL	Sold to authorized recycler

Recycling of Products & Waste

Being in the field of producing primary aluminium, the thrust is given to recycling the inevitable process wastes to the maximum possible extent.. The aluminium dross generated in melting furnaces are processed in autogenous mills where metal is separated from bath material and the recovered metal is recycled. The aluminium wedges used for bypassing pots, pot hoods, pot cowl, residual metal pad etc are melted and recycled through potline scrap melting furnace.

Priority is given to sustainable use of water and we recover and reutilize water where ever possible. All our production units are zero discharge units with respect to their waste water and sewerage water management. The treated waste water was reused in process and sewerage water is used for horticulture. Augmentation and recycling of waste water at our Smelter plant by reverse osmosis process is planned. In CPP, the ash pond overflow water is recycled & reused in the ash disposal system and during year 2013-14, from the ash pond 1,29,81,238 cubic meter water was recycled. Recovery and reuse of different wastes etc. in our Operations, are stated below:

Unit	Utilisation	Percentage
Bauxite Mines	Overburden is utilized for reclamation for mined out areas	100%
Alumina Refinery	Caustic Soda is recycled from redmud	6.55%
	Ash utilization	69.64%
Smelter	Aluminium dross recycled as input to process	70.80%
CPP	Ash Utilisation	71.67%

..... A major Environment Initiative

To address global environment issues such as climate change, global warming one major initiative taken is the pilot project of Carbon Sequestration plant at CPP commissioned in 2012-13 and which is under operation during 2013-14, with estimated reduction of carbon dioxide of 20 T/acre/year. A detailed case study on this follows:

Pilot cum Demonstration Carbon Sequestration Project at the Captive Power Plant

Given the context of increasing global concern on climate change, NALCO has adopted proactive approach to combat the same by taking initiatives such as carbon Sequestration Study & reducing the fuel consumption which contributes to climate change. Carbon dioxide can be naturally captured from the atmosphere through biological, chemical or physical processes. Some anthropogenic sequestration techniques exploit these natural processes, while some use entirely artificial processes. While the majority of global CO₂ emissions are from the burning of fossil fuels, roughly 1/4th of the carbon emissions entering the atmosphere are from land-use change.

Carbon sequestration is the process of capture and long-term storage of atmospheric carbon dioxide (CO₂). The technique essentially relies on long-term storage of carbon dioxide or other forms of carbon which helps mitigate global warming. It has been considered as a way to slow down the atmospheric and marine accumulation of greenhouse gases, which are released by burning fossil fuels.

On an average, a 500-MW coal-fired power plant produces approximately 3 million tons of carbon dioxide (CO₂) per year. The flue gas thus generated from power plant contains 10–15% CO₂, which can serve as a source of CO₂ for microalgae cultivation to biologically sequester the carbon. The recovered algae can be co-fired with coal or processed further for value added applications. However, this presents carbon sequestering technology developers with a number of challenges including



Algae is capable of sequestering more than 100 times that of any forest ecosystem can for a similar land foot print. For example, an actively managed forest like Pine plantations can accumulate almost 100 metric tons of carbon per acre after 90 years, or roughly one metric ton of carbon per acre per year. This same quantity can be sequestered by algae within one year in about an acre. Algae is also comparatively very efficient than current agricultural land use yields. For example, if soybean production is 1.16 tons per acre per year, Algae can produce 50 times equivalent of this yield as biomass which can compensate for many of the end uses.

additional unit at sites for the process, downstream processing and marketing & distribution of the product.

With the objective to compensate for CO₂ equivalent resulting from land use change, NALCO initiated a study cum demonstration project on carbon sequestration technique in the captive thermal power plant situated at Angul, Odisha. The purpose of the study was to envisage the carbon sequestering master plan for effective large scale development and implementation of green energy generation capacity in the thermal power plants for Indian companies. The pilot study cum demonstration project was based on the following facts and Hypothesis:

1. Microalgae photosynthesis being the fastest mode of photosynthesis, their adaptation for the purpose of carbon sequestration will yield better carbon sequestration rates than any other biological systems.
2. The Flue gas from a thermal power plant can be adopted for an microalgal cultivation purpose
3. Flue gas having more than 15% of CO₂ content will enhance the growth rate of algae
4. Microalgae with suitable adaptation and selection techniques can be mass cultivated using biotechnology to yield measurable carbon capture
5. The sequestered carbon via algal biomass can result in potential value addition route and open an area of CDM (Clean Development Mechanism) for the technology can be a global leader as the world's first commercial carbon sequestration plant.

STUDY

Production Technology Steps:

The cultivation (production) technology involves following operation steps:

Step 1: Supply of pre-treated flue gas as carbon source after

- Removing suspended solids/fly ash
- Reducing the gas temperature
- Piping the gas at appropriate pressure to the gas injection procedure

Step 2: Dispersion of the flue gas (in to the water medium & introduction in to the cultivation area)

Step 3: Cultivation of Algae by providing optimum conditions for allowing photosynthetic fixation of carbon in to the biomass (subsequent scale-up of supply for operation to production tank)

Step 4: Continuous / batch cultivation in production tank to sequester the

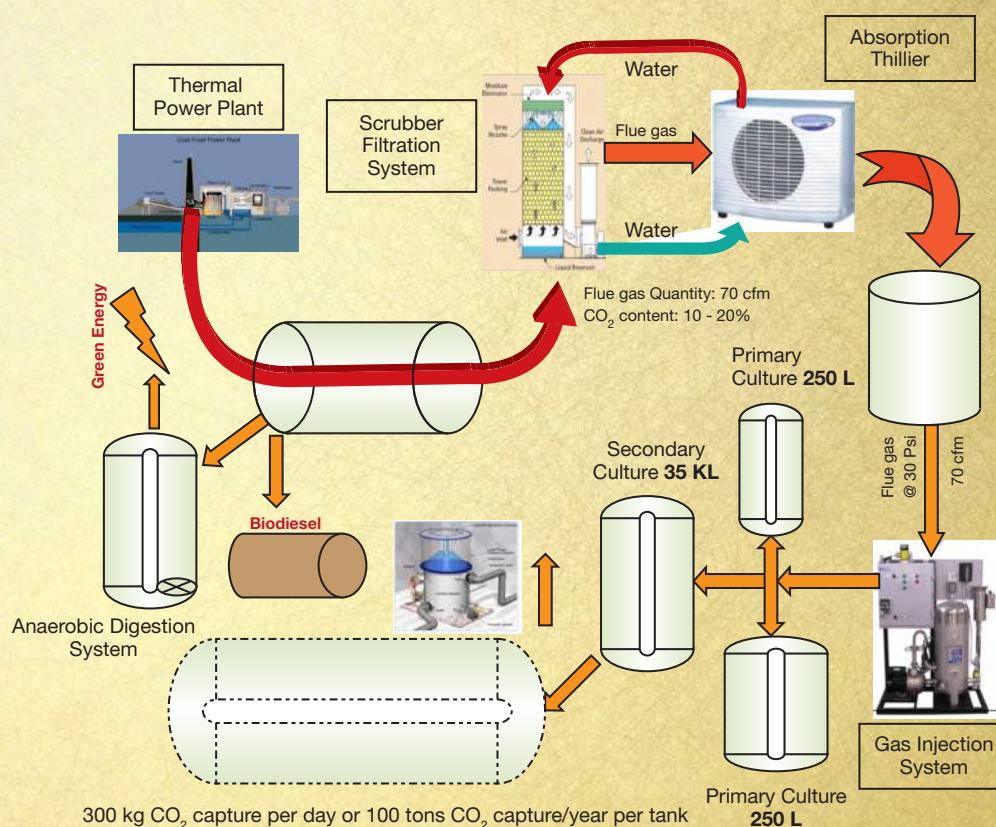
carbon and produce biomass on a day and night supply cycle.

Step 5: Fractionation and filtration harvesting procedures to obtain biomass in a batch / continuous basis.

Step 6: Drying, testing and packing as feed grade product and supply the oil rich biomass for bio-diesel/ bio-energy production companies.

Technology flow chart:

The following scheme represents the technical steps involved to make a feasible algal cultivation system.



Key Learnings

The study has given insights into the issues involved in the development & implementation of technology and demonstration of same to other similar industries to promote the growth of bio-energy industry with the objective to reduce GHG emission in the state of Orissa.

The project has demonstrated the potential to capture carbon dioxide present in the flue gas. The quantity of biomass generated from the process is equivalent to carbon

captured from flue gas. All the carbon content in the biomass results from carbon dioxide present in flue gas since no other source of carbon is fed in to the system. The targeted application of the product has been observed as "high protein content feed stock" that is suitable for nitrogen fertilizer, feed, biomaterial / biodegradable plastics, biodiesel and biofuel. The study has established the potential of algae as a value added & sustainability oriented product, especially for thermal power industries.



BUSINESS SUSTAINABILITY

Life Cycle of a Mine

The business of NALCO starts with mining. The mine lifecycle refers to the span from discovery of mineral resource to the final closure of mines with reclaimed land. The exploration of the currently active Central-North Block of Mines can be traced back to late 1970s with the actual commissioning done in the year 1985-86. We have adhered to the principles of sustainability throughout the lifecycle phases to ensure sustained outcome.

Bauxite mining involves extraction of natural resources and has an impact on air, water, land, flora and fauna of the region. But careful planning of the mining process minimises the adverse impact on the environment. Adhering to the approaches of environmental consciousness & community upliftment while striving for economic growth & prosperity has helped to graduate to more sustainable techniques of mining. Sustainable mining involves selection of right technology, taking environmental pollution control measures, preserving the environment, benefitting people living in the surroundings, and ushering in economic benefits. For operating all the units of NALCO & for expansion of capacity of production in each unit, NALCO

carries out Environment Impact Assessment and also follows Environment Management Plan approved by the respective regulatory authority in letter & spirit to redress any negative impact on environment or society. During the year 2013-14, total quantity of 22,83,650 MT of overburden was generated, 100% of which was effectively used to fill the mined out area.

Considering major factors like topography, estimated reserve & grade, thickness and nature of overburden as well as bauxite, capital available and production target, opencast trench method of mining is adopted on three shift basis with the deployment of major heavy earth moving machinery (HEMM) like ripper dozer, blast hole drill, front-end loader, back-hoe, dumper, toothed double roll crusher and cable belt conveyor. Appropriate techniques of soil conservation, water conservation, plantation & afforestation are applied to rehabilitate the disturbed area. All unit operations are equipped with the relevant equipments at the project stage to prevent pollution and control it within the prescribed standard. Mitigation measures are adopted to address any adverse impact.

Adverse Impacts

Mitigation

EXPLORATION	
Land aquisition & related issues, resettlement & rehabilitation of land oustees, natural resource explotation	Local economic development through the purchase of local goods and services
DESIGN & DEVELOPMENT/CONSTRUCTION	
Soil Excavation, loss of biodiversity, dust & noise pollution	Strict adherence to legal requirements, Safety in operatiosn, state of art technology,EIA reports , human safety & health prtotection measurements, skill development
OPERATION & EXPANSION	
Safety of contractual workers, soil contamination, water pollution, fuel consumption, electricity consumption, occupational diseases risks	Compliance to safety standards/conditions prescribed by various statutory authorities like MOEF, SPCB, Odisha, IBM, etc, increase in job opportunities due to operation & expansion plans, upgradation of skills for sustainable livelihood after closure of mine

The Panchpatmali Bauxite Mine has adopted concurrent rehabilitation method of mining, which is a part of the approved mining plan. The Mine has an approved progressive mine closure plan from Indian Bureau of Mines which entails concurrent rehabilitation of mined out area. Detailed methodology is laid down for closure of mined out land, water quality management, air quality management, waste management, top soil management, disposal of mining machinery, disaster management and safety and security. The total leased area of mines is 1843.624 Ha. The progressive mine closure plan is being implemented and monitored on continued basis.

Adequate measures are being taken to enhance the skill levels of the persons from surrounding villages so that they can sustain their life even after closure of the mines. NALCO also has a wildlife conservation plan in place. A biodiversity study has also been conducted for mines.

NALCO has a dedicated Bio-diversity management plan in place though none of the sites are affecting any of the biodiversity/protected area. None of the IUCN red list species and National conservation list species are affected

by NALCO operations at unit level & species available in Buffer zone are conserved in situ as per approved wildlife conservation plan with funds from NALCO deposited in CAMPA Fund, Ministry of Environment Forest & Climate Change, Government of India. An effort has been taken by NALCO to strategically protect the biodiversity areas. A wildlife management plan approved by PCCF (Wildlife), Odisha, for the Central and North Block of Panchpatmali Bauxite mine has been prepared by Envotech & Management Consultancy Pvt Ltd. As per their survey, the Mines Lease area (core area) is devoid of tree growth, the vegetation consists of scrub only, which supports only a few small animals. No schedule1 species, as per the Wildlife Conservation Act-1972, are present within the core zone.

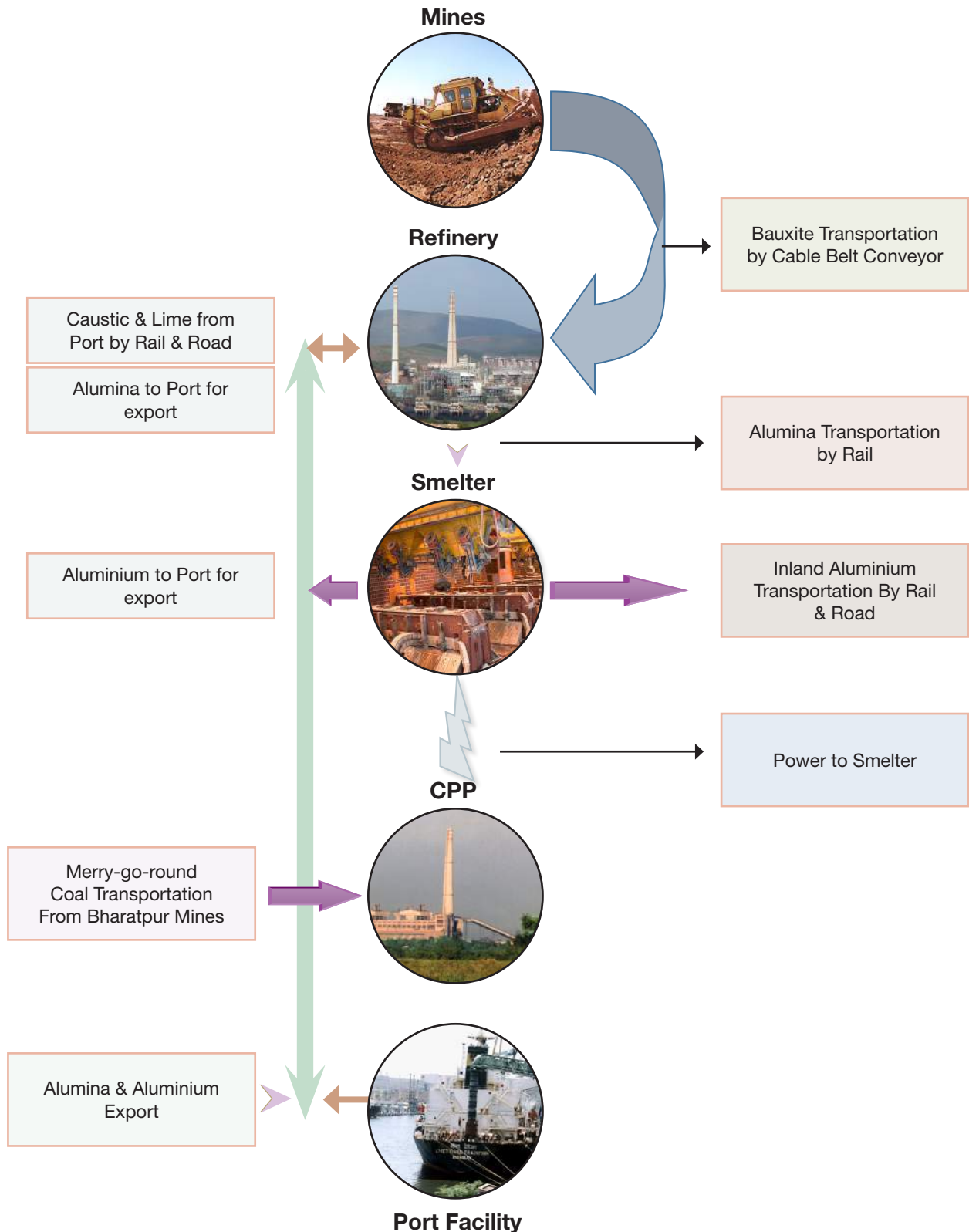
Further, NALCO has entrusted the responsibility of carrying out a study on bio-diversity in and around Panchpatmali Bauxite Mine Central & North Block with Botany Department, Utkal University. The study has already started and measures to minimise impact on biodiversity, will be implemented.



..... Our Sustainable Logistics Framework

Due to our direct control over the mining, transportation & extraction activities, we are able to ensure sustainability throughout the process. In our process, environmental footprint is reduced by transportation of bauxite in a single flight

multi-curve long distance cable belt conveyor. Similarly a dedicated merry-go-round (MGR) captive rail system is used between the Captive Power Plant to Smelter and the Bharatpur Coal Mines of MCL.



Towards Sustainable Sourcing

At NALCO, sustainable sourcing of raw material has been ensured primarily by establishing the manufacturing units close to the source of raw material. This is done to avoid environmental impacts like pollution due to transportation of raw material, fuel used in transportation, etc. For example: The Bauxite Mines, which cater to 100% bauxite requirement of Alumina Refinery, are situated very close to it. Similarly, the Captive Power Plant for our Smelter is close to the coal mines of M/s MCL from where coal is procured as per fuel supply agreement (FSA). Shortfall in coal availability, due to gap between our requirements and receipts through FSA is bridged by purchase of coal through e-auctions and/or import, based on cost-benefit analysis. All bulk raw materials ie. Caustic soda, lime, CT Pitch, CP Coke, Aluminium Fluoride etc. are procured from multiple vendors in order to ensure seamless supply. Continuous efforts are made to expand the vendor base to ensure sustainability in sourcing stores & raw material. Our consumption of various raw material has been given in the table below:

Material consumed [Unit]		2011-12	2012-13	2013-14
Raw Material	Alumina [MT]	8,06,740	7,95,432	6,13,943
	Coke [MT]	1,59,969	1,56,163	1,16,988
	Pitch [MT]	36,634	37,445	27,621
	Coal [MT]	67,28,480	68,63,062	61,34,620
	Bauxite [MT]	50,02,626	54,19,391	62,92,677
	Caustic Soda [MT]	1,44,631	1,57,674	1,88,279
Associated Process Material	Aluminium Fluoride [MT]	8,279	7,463	5,606
	Wheat Bran [MT]	2,049	1,972	2,369
	Lime [MT]	44,845	57,946	60,660
	Explosives [MT]	835	936	1,013
Packaging Material	VSI HDPE fabric [sq mtrs]	4,36,961	4,76,775	5,16,082
	Wood in wooden pallets [Cubic feet]	13,844	15,311	17,109
	Steel straps [MT]	195	179	172
	Polyster Strap [MT]	71	78	52
	HDPE Laminated bags for hydrate & Alumina [Nos.]	7,59,999	5,39,328	5,35,633

.....Towards Operational Excellence

NALCO makes continuous sustained efforts towards better process control, improvements in process and dedicated R&D initiatives to enhance competitiveness of our products. The total expenditure on R&D during 2013-14, 2012-13 & 2011-12 has been Rs. 1,387 lakhs, Rs.1,892 lakhs & Rs. 1115 lakhs respectively. During 2013-14, two patents were filed, one previously filed patent was granted and one patent was commercialised. Efforts are made towards bringing in innovation & improvements to consistently reduce consumption and

produce quality products with better energy efficiency, thereby reducing the carbon footprint. Some operational efficiency measures include:

- Reduction of Aluminium Fluoride consumption at Smelter to about 18 KG/MT
- Reduction of Lime consumption at Alumina Refinery to about 32 KG/MT
- Reduction of DC Power consumption at Smelter to about 13,400 KWHr/MT

We consciously try to minimize our raw material consumption as shown below:

Specific consumption per unit of production

Specific Consumption per unit of production	Norm/MOU Target (2012-14)	Previous Year (2012-13)	Current Year (2013-14)
Explosive consumption (Bauxite Mines)	165 gm/T	125 gm/T	120 gm/T
HFO consumption (Alumina Plant)	81 Ltr/MT	83.79 Ltr/MT	81.59 Ltr/MT
DC Energy consumption (Smelter)	13,500 KWH/MT	13,394 KWH/MT	13,408 KWH/MT
AC Energy consumption (Smelter)	14,850 KWH/MT	14,705 KWH/MT	14,754 KWH/MT
HFO consumption (Smelter)	90 Ltr/MT	71 Ltr/MT	57 Ltr/MT
Aluminium Fluoride Consumption (Smelter)	19.5 Kg/MT	18.5 Kg/MT	17.71 Kg/MT
Fuel Oil consumption (CPP)	1.1 ml/KWH	3.27 ml/KWH	1.01 ml/KWH

The slotted anodes are used in Smelter plant in the electrolysis process. Pre-baked anodes are passed through a slot cutting machine whereby two slots of 200mm height and 10mm width are made. Slotted anodes have been found useful in expelling gas bubbles out of pot easily, resulting in ohmic voltage drop to the tune of 50 ~100mv. Reduction of instability has also been due to reduction of bubble layer underneath the anode. DC energy consumption has reduced considerably due to this initiative.

The Low density hollow bricks (0.9-1.2 gm/cm) & Light weight foamed bricks (LWFB) are prepared using red mud with minimal quantity of foaming agent (sodium hydroxide and aluminium powder) under different conditions. The cost of the above foaming brick is Rs. 1.50/brick with Coal firing & strength 3.1-3.6 N/Sq mm. The application however, is limited

to partitions, boundary walls, etc., due to lower strength, even though they are good standard.

The feasibility of using fly ash in making floor and wall tiles is being explored. Mixture of 60% to 70% fly ash, 5% to 20% red mud, 10% to 30% clay of different origins, 0.5-1% dextrin and required amount of water are prepared. Such mixtures are then compacted in a conventional hydraulic press for required shape and size with hydraulic pressure of 200Kg/cm. This is followed by slow drying the pressed green tiles from ambient to 900°C and holding for 2 hour at 900°C. Then the pressed and preheated tiles are sintered in a conventional heat treatment furnace at a temperature of 1200°C for one to two hours. Industrial scale trial is currently being used to assess the cost economics.

Studies have been undertaken to establish suitable source and optimum parameters for extraction of Vanadium sludge from various Bayer Liquors. Lab scale studies have been completed.

A Pilot trial using the existing facilities available in Zeolite Plant was completed in 2013-14.

A detailed case study follows:

CASE STUDY

Pilot Study for extraction of vanadium sludge from green liquor at Alumina Refinery, Damanjodi



An in-house R&D Project was carried out by NALCO Alumina Refinery at Damanjodi to extract vanadium from the sludge generated in the process to put it to more beneficial use for wider applications in other industries. The process involves extraction of alumina from bauxite ore using Bayer's process. Apart from other wastes generated, vanadium is a by-product of Bayer process. Bauxite deposits are invariably associated with small quantities of vanadium with V_2O_5 content varying up to 0.08%. During digestion, about 30-40% of the vanadium in Bauxite dissolves in the caustic liquor as sodium vanadate and the rest undissolved vanadium goes out with the Red Mud. The dissolved vanadium is not precipitated along with the alumina tri-hydrate and gradually builds up in the caustic liquor during its recycling. These get precipitated as scales containing double salts of Vanadium and Phosphorous, in the concentrated and cooler areas of the circuit, imposing flow restrictions in the plant.

Vanadium is a value added by-product and finds variety of applications in other industries. The steel industry accounts for more than 80% of the world's consumption of vanadium. Vanadium is principally used as an alloying element in iron and steel to improve both its toughness and its ductility. Such high-strength, low-alloy (HSLA) steels are attractive for high-rise buildings, bridges, pipelines,

and automobiles because of the weight savings obtained. Vanadium is also used in the production of titanium alloys for the aerospace industry and as the catalyst for the production of maleic anhydride and sulfuric acid.

During the analysis, Panchpatmali bauxite was analysed to have around 0.06-0.08% of V_2O_5 . NALCO Green Liquor has 1.0-1.3 gpl V_2O_5 in addition to other dissolved salts (like Phosphates, fluorides, Chlorides, sulfates etc). The analysis of the scales identified the root cause of heavy scaling in different equipments and pipelines especially in evaporation unit as due to vanadium.

In the process, Green Liquor (GL) was taken in 3 of the tanks of Zeolite plant. The V_2O_5 content in the filled GL was analyzed to be 0.95 gpl. The liquor was allowed to cool. The slurry was then filtered in filter press of Zeolite plant. The sludge, so collected has approx 9-10% V_2O_5 . Around 6 Ton of Vanadium sludge was extracted with approximate 10% V_2O_5 content, for test marketing.

The removal of Vanadium from circuit liquor helps control the scaling in pipes and equipments, thereby enhancing flow and heat transfer. The sludge also traps other impurities like P_2O_5 , MgO, F, Cl, etc, thus helping in maintaining product quality and liquor productivity. This acts as a means of cost saving by eliminating additional lime required for control of vanadium and phosphorous.

Customer-centric Approach

NALCO has taken initiatives to be customer-centric, its motto being to provide better service to customers. Our products, Aluminium and Calcined Alumina, are widely sought after by customers because of the high quality of the products & associated service. Quality of Aluminium produced is as per P1020A specifications required for London Metal Exchange registration. Similarly, Alumina Hydrate and Calcined Alumina are produced as per internationally recognized metallurgical grade alumina standard.

Our products, through our customers, reach the end users for use in different sectors. We always strive to make our production processes and products increasingly sustainable. In the transportation sector, use of Aluminium reduces the overall weight of an automobile/ aircraft

or commercial vehicle as compared to other metals.

This improves the fuel economy resulting in net positive environmental impact achieved by significant reduction of emissions during vehicle use phase.

NALCO meets the requirements with respect to product labeling by following the practices as prescribed by law. For e.g. in case of Aluminium metal, the product grade, stack no., bundle no., net weight is displayed on the product label. In case of Rolled Products, Name of the Company & production unit and place, Coil No, Grade, Size (Thickness X Width) in mm, Net Weight (in kgs.), Signature of the inspecting authority, Date of Packaging, No. of sub-stacks and total no. of sheets per packet (for Rolled sheets only) is displayed on the product label.



Sustainable Development Policy highlights economic issues to be addressed for enhancing value creation for Stakeholders and the Mission Statement focuses on Customer Satisfaction. Meeting the needs and expectations of the customer by consistently improving our performance, is also our chosen path in achieving business excellence and fulfilling other social obligations.

Our commitment towards customer satisfaction is reflected in our concern for quick redressal of customer complaints.

There has not been any case filed by any stakeholder against the company regarding unfair trade practices, irresponsible advertising and/or anti-competitive behaviour during the last five years.

NALCO conducts customer satisfaction survey, twice a year, for mapping the satisfaction index and collecting customers' feedback. The trends are then analysed to internally benchmark the performance to improve further. We are proud to have achieved targetted customer satisfaction level feedback from 100% of the respondents.



COMMUNITY ENGAGEMENT

Community engagement is accorded a very high priority in NALCO, demonstrated through Sustainable Development Policy, CSR policy & a dedicated body like NALCO foundation to implement the projects. Focused initiatives on Sustainability and CSR activities are taken up for the benefit of local and marginalized communities within 15 km radius at our sites. These initiatives also include promoting arts, culture and sports. In that direction, different State level and National level sports like Hockey, Basketball, Golf and Volleyball tournaments are sponsored. As a matter of policy, sports persons of the State participating and excelling in the field of sports are felicitated on Utkal Divas to encourage upcoming talent.

Two percent of our net profit is allocated to CSR activities – 1% is spent on Periphery Development activities through the Rehabilitation and Periphery Development Advisory Committees (RPDACs) set up by the Govt. of Odisha and 1% through the NALCO Foundation, following the guidelines on CSR of CPSEs issued by Govt. of India.

Our Rehabilitation & Resettlement policies comply with regulatory norms. During 2013-14, there were no significant disputes relating to land use or with local communities. Since no new land was aquired during the reporting period, there were no resettlements or livelihood issues. Also, none of our mining sites are located in the vicinity of artisanal and small scale mining.

A need assessment survey is carried out to identify the needs of the communities. RPDACs under the chairmanship of RDC for Northern Division & Southern Division has a dual objective – finalizing the Peripheral Development projects for Angul and Damanjodi regions respectively and monitoring and evaluation of the projects. The CSR activities/projects are executed by the Project Implementing Agencies (PIAs) selected on the basis of their competence level. NALCO foundation tracks the progress of the projects and monitors it regularly. Social impact assessment is done by a reputed third party.



The community is involved in each and every stage of the project starting from planning to implementation and monitoring stages. Suggestions of villagers are sought through "Village level development committees" to prepare an action plan for improvements in their villages. NALCO makes an effort towards betterment of surrounding communities by providing better civic amenities & employment opportunities, access to Health Care Services, provision of Safe drinking water and hygienic living conditions. Moreover, villagers can avail helath care and medical facilities at NALCO hospital as well as mobile helath care services. With addition of two more mobile helath units (MHU), the total number of MHUs operating at Angul and Damanjodi has gone upto 8. During 2013-14, 2463 camps Were conducted and 1,09,166 patients from periphery villages at Damanjodi and Angul were treated and provided medicines free of cost.





During 2013-14, 254 tribal children of periphery villages at Damanjodi were admitted in residential schools at Koraput, Jeypore and Bhubaneswar. Since the inception of this scheme, 655 children have benefitted from this opportunity and are still continuing their education in such institutes. The entire cost of their education is borne by NALCO Foundation, the CSR arm of the Company.

Attempts are made to bring about a positive change in the lives of people residing in communities surrounding our operations. We have undertaken activities such as development of rural roads, culverts, bridges, construction and renovation of rural schools, community halls, development of public places, development of primary health centres, drinking water schemes like supply of pipe drinking water, digging of tube wells, open wells, development and renovation of village ponds, animal health camps, mobile health care service, awareness programme on environment, health & hygiene, village sanitation programme, arranging rural games, sports and cultural activities. Moreover, all the units also have mechanisms in place to receive and address grievances of the local communities, if any. During 2013-14 Rs. 29 crore was spent towards CSR activities as against Rs.30.99 crore spent during 2012-13.



Sustainable Livelihood

NALCO does not discriminate between its employees on any ground. Infact it takes due care for the upliftment & development of all – its contractual workforce, local supplier & contractors, vendors etc. Employment of people from Odisha domicile is described in the Social Capital section. It does not believe in disparity with respect to wages being offered to the contractual employees as compared to the prescribed minimum wages by government of Odisha.

NALCO's standard entry level wages compared to local minimum wages

	Minimum Wages prescribed by government of Odisha (Rs. / day)	Wages offered by NALCO (Rs. / day)	Percentage higher than minimum prescribed
Unskilled	215	254	18.1%
Semi-skilled	235	308	31.0%
Skilled	255	364	42.7%
Highly Skilled	270	418	68.2%

NALCO has developed an “Ancillary & Downstream Development Programme” to promote local suppliers & vendors to generate sustainable livelihood. We recognise the role played by the MSE sector in the development of the Nation and have always laid emphasis towards creation of development opportunities for Micro & Small Enterprise (MSE) Units. NALCO has done this by encouraging Micro & small enterprise under its “Ancillary & Downstream Development Programme” to produce construction material. Same has been utilised by NALCO during the construction of its units, during its operation stages and after.

Sustained livelihood for the enterprises has always been ensured by NALCO. NALCO adopts the policy and guidelines laid down by the Department of Public Enterprises, Government of India. Wherever possible, the local suppliers are preferred for providing material & other services. NALCO has created a strong influence on the local economy beyond direct jobs and payment of wages and taxes by supporting local businesses in the supply chain. This has been an important factor for NALCO in contributing to the local economy and maintaining community relations.

NALCO also has a well-developed strategy in place for encouraging local suppliers and vendors. It basically relies on participatory approach allowing them to participate in our tenders by providing special benefits such as exemption from payment of tender fees and earnest money deposit, providing technical know-how and managerial guidance. NALCO has also set up MSE facilitation cells (Ancillary Development Cell) for disseminating relevant information and offering guidance to the interested prospective entrepreneurs. Along with this, list of goods and services which can be procured from MSEs are displayed on NALCO's website. Permanent display halls at S&P complex exhibit the materials required along with important information like technical specifications, annual requirement, price in the last purchase order for information of Micro & Small Enterprises (MSE) vendors. During 2013-14, four units from Odisha, two of them in the proximity of our plants, were accorded ancillary status. The total number of ancillary units has now increased to 57. The purchase and other services from such units has increased to 19.3% during 2013-14 from 18.7% during 2012-13 and 17.6% during 2011-12.

Continuous efforts are made to engage the local MSEs and induce them to improve their contribution. Two sub-plant level ancillary committee meetings were held at our units at Angul and Damanjodi during the 2013-14. Buyers and sellers interaction meeting, vendor training programme for SC & ST, MSEs and Entrepreneurship development programme were conducted at our Training Institute at S & P Complex, Angul. Entrepreneurs week was also organized at M&R Complex with special focus on developing entrepreneurs amongst SC & ST aspirants. We also participated in various MSE exhibitions like MSME Enterprise Odisha 2013 at Cuttack; Enterprise Odisha 2013 at Bhubaneswar and Odisha MSME International Trade Fair 2014 at Bhubaneswar.



OUR SOCIAL CAPITAL



Employees are the most important resource of an organisation. Their growth and well-being is tied to the growth of the company. During 2013-14, 7425 regular employees were engaged in our units at Angul & Damanjodi, Port Facilities at Vizag, Corporate Office at Bhubaneswar, Regional Offices at New Delhi, Mumbai, Chennai, Kolkata and Offices at Paradeep & Bangalore.

In the units at Angul & Damanjodi, out of total 6892 regular employees, about 92.7% are domiciles of Odisha. In the office areas, considering all employees at Corporate, Regional Offices, Ports and Branch Offices,

the total strength of regular employees is 533, out of which Odisha domiciles constitute 67.78%.

Besides this, on contractual basis, 12 employees are engaged in the areas of Security Advisory, Ayurvedic, Homeopathy, Nursing and Civil Engineering Supervision. There are various outsourced jobs also, where job contractors have engaged 10,708 employees, out of which about 95% are from Odisha.

Our human capital is a healthy mix of age, gender and cultural backgrounds as shown in the statistics below:

Total No. of employees (as on 31.03.2014)

Type of Employees	Male			Female			Total
	<30	30-45	>45	<30	30-45	>45	
Executives	138	514	1089	16	20	32	1809
Non-Executives	295	1669	3371	21	117	143	5616
Total	433	2183	4460	37	137	175	7425

Employees' skill-mix & Gender diversity

Type of Employees	2012-13			2013-14		
	Male	Female	Total	Male	Female	Total
Executives	1731	68	1799	1741	68	1809
Non-Executives	5471	285	5756	5335	281	5616
Supervisory	815	48	863	833	48	881
Highly skilled/Skilled	3821	130	3951	3710	129	3839
Semi-skilled/Unskilled	835	107	942	792	104	896
Total	7202	353	7555	7076	349	7425

Note: This table re-states the data provided for FY 2012-13 in the previous sustainability report.

At NALCO, we realise that to keep the company dynamic, progressive and to keep-up with the changing global trends, we need the zeal of young minds. Towards this, over the previous few years, we have consciously been focusing on hiring young talent.

New hires during the reporting period

Type of Employees	Male			Female		
	<30	30-45	>45	<30	30-45	>45
Executives	39	11	-	2	1	-
Non-Executives	1	-	-	-	-	-
Total	40	11	-	2	1	-

Talent Management

Nurturing the talent of employees is an integral part of our culture. Performance Appraisals are conducted for all the executives every year. Employees are given opportunities, right from building capacity to implementing ideas & concepts & bringing innovation in the portfolio of services they perform & even beyond. Training is accorded priority for continuous development of employees, commensurate with the growth strategy of the organisation. During 2013-14, 2.46 mandays of training per employee was provided, covering almost 69% employees (5128 out of 7425).

For the same period, average training hours for Executives was 45.6 (30.2 hours for males and 15.4 hours for females) and for Non-executives was 42.2 hours (28.7 hours for males and 13.5 hours for females).

Emphasis was given to specific position related trainings. Regular feedbacks are taken regarding the trainings conducted and evaluation of feedback is carried out for improving the quality of training programmes. Out of a total of 2540 SC/ST employees (FY 2013-14), 2250 were nominated for different training programmes. Below given is the statistics of the trainings conducted at NALCO during 2013-14:

Employee Category	No. Of employees trained		Training Man-Days		Training Hours	
	Male	Female	Male	Female	Male	Female
Executives	1711	55	6460.5	106	51684	848
Non-Executives	3183	179	11423.5	303	91388	2424
	4894	234	17884	409	143072	3272

During 2013-14, 5,128 employees were imparted 18,293 man-days of training. During 2012-13, 21,205 man-days of training was imparted to 6,003 employees and the respective figures for 2011-2012 were, 21,195 man-days of training to 7,993 employees.*

Safety & Skill Upgradation Programmes

The coverage of employees with respect to skill upgradation training is mentioned below:

Permanent Employees	44.08%
Permanent women employees	22.48%
Casual/ Temporary/ Contractual Employees	14.12%
Employees with disabilities	5.88%

Honing Team Creativity

At NALCO, it is our constant endeavour to hone the intellect and creativity of our people and provide opportunities to improve their performance. Group activities like **Quality Circles** are catalysts in achieving the dual objectives of achieving operational excellence while providing competitive satisfaction. Towards this, each year, we provide a platform for teams from Odisha-based organisations to showcase their projects. Good performers are also felicitated in the convention to propagate the concepts, across the state. In the convention, competitions are organised in two streams – Quality Circles and TPM Circles, for organisations/ companies located in the State, followed by a display of various models prepared by the teams. During this year, the convention was organised at our premises in Bhubaneswar, on 24th-25th April'13. The teams, nominated by respective organisations based on their performance during the previous year, participated in the convention. In total, 26 Quality Circles and seven TPM

Circles from 20 production units of Odisha presented their projects, providing a great learning experience to others who have either introduced small group activities in their organisation, or are planning to do so.



* Re-statement of data provided in the previous sustainability report (2012-13).

Employee Separation

NALCO is an employee-friendly organisation with a good amount of focus on the professional and personal well-being of its employees. This is reflected in the low attrition rate amongst its employees.

Reason	Executives		Non Executives		Total
	Male	Female	Male	Female	
Demise	3	0	20	2	25
Resignation	10	1	0	0	11
Superannuation	43	1	91	1	136
Termination/Struck Off	1	0	1	0	2
Total	57	2	112	3	174

.....Equal Opportunity Employer.....

Our transparent system processes and procedures related to hiring, promotion, and other growth opportunities are non-discriminatory. With respect to recruitment, NALCO brings out advertisements in local employment exchange, vernacular / national news papers /employment news for technical and unskilled positions. In hiring process, local candidates are provided equal opportunity, if they have the required qualifications & skills.

Discrimination of any kind based on age, gender, caste, race or religion etc is strongly discouraged. NALCO's Code of Business conduct and ethics for board members and Senior Management, mandates fairness & non-discrimination on the basis of race, gender or religion and values of equality, tolerance, respect for others are stressed upon.

NALCO has adopted a proactive approach to strictly deal with issues like discrimination in order to avoid even a single occasion where basic human rights & dignity may be violated. Practicing whistle blower policy has been at the core of it. This results in an immediate cognizance of the employee grievances. NALCO has also constituted Internal Complaints Committee on Sexual Harassment of Women in view of Sexual Harassment of Women at workplace (Prevention, Prohibition & Redressal) Act, 2013 to protect women against any kind of sexual harassment at workplace and redressal of such complaints and other related matters. Towards the end of the year, one

case on sexual harassment was pending, which is being investigated.

To further promote equitable & fair working culture there are formal grievance mechanisms in place. Adequate mechanisms like grievance box/complaint box, etc., allow employees to express their grievances without disclosing their identity. According to the nature of grievance, investigation is initiated and corrective actions are taken. With our belief that an effective grievance mechanism will foster healthy relationship between the organisation & its employees. No case of discrimination of any kind has been reported during 2013-14. This is demonstrated by good retention rate & diversity with respect to employees (depicted in the table and chart below).

As per Presidential Directives, efforts have been made for recruitment/ promotion of SC/ST candidates. NALCO also complies with the provisions of the Persons with Disabilities Act, 1995. In order to have control over the implementation of Presidential Directives as well as Government instructions/ guidelines, Liaison Officers for SCs/STs have been appointed to look after the reservation matters for SCs/STs as well as Persons with Disabilities. As on 31.03.2014, out of 7,425 employees (including trainees) on the roll, there were 1,199 SCs (16.15%), 1,341 STs (18.06%), 769 OBCs (10.36%) and 79 Persons with Disabilities (1.06%). The total number of lady employees in the organization stands at 349.

Employee Benefits

Nalco extends lot of benefits to its permanent employees, which include medical facilities, leave travel concession, accommodation, electricity, water facilities, up-keep allowance, parental leave, pension schemes, etc. During 2013-14, Rs. 1245 crore was spent towards employee benefits by NALCO. 159 males & 11 females availed parental leave. All of them returned to work and have been continuing their job as on date. Some defined benefit schemes are as under:

- Provident Fund
- Pension Fund
- Gratuity
- Post-retirement Medical Benefit
- NEFFARS (NALCO Employees Family Financial Assistance Rehabilitation Scheme)
- Long Service Reward

During 2013-14, Employee Benefit expenses amounted to Rs 1,245 crore compared to 1,154 crore in 2012-13.

Contract employees are also covered under some benefit schemes such as Provident Fund, Medical benefits, etc.



Participative Management & Industrial Relations

The non-executive employees as well as the workmen engaged by job contractors for different outsourced jobs, have the freedom to form or join in any existing trade union of their choice. In the process, 28 Trade Unions are formed by regular employees and 20 trade unions are operating for contractual workers in outsourced jobs. Almost 100% of our non-executive employees are members of trade unions. They play an active role in safeguarding the fair interests of workmen in a constructive manner. The recognized unions (RU) are involved in all matters in the purview of collective bargaining. Representatives of the RUs are nominated to different joint participative committees like Canteen Management Committee, Safety Committee, Grievance Committee, Welfare Committee, etc. and they get involved in the committees starting from shop floor level to the

apex level during discussions on matters relating to production, quality, cost-control, environmental matters and sustainability, factoring in participative management in its true sense. NALCO respect the rights and privileges of the registered trade unions, providing a conducive environment for maintaining good Industrial relations. The five recognized trade unions at units are:

Units	Name of RUs
Smelter	Aluminium Mazdoor Sangh
Captive Power Plant	Nalco Shramik Congress Union
Mines	Nalco Mines Employees Union
Alumina Refinery	Nalco Employees Union
Corporate Office including Port Facility & Regional Offices	Nalco Employees Forum





.....Employee Health & Safety.....

Sustainable operation of an Industry demands attention towards its three vital areas – Environment, Safety and Occupational Health. As a responsible corporate entity, NALCO has taken utmost care of the environment, safety and occupational health issues in all its activities. All production units are OHSAS 18001 certified. The intermediaries and final product of NALCO does not have any negative impact on health & safety of the people involved and there has been no non-compliance regarding these aspects.

For developing awareness on safety & occupational health, NALCO has been continuously imparting internal as well as external training to its employees and contract workers. It has provided Occupational Health Centre (OHC) at its S&P Complex as well as M&R Complex. They both have well equipped OHCs with qualified doctors, technical staff & modern testing facilities. The analysis of PME results indicates no Occupational Diseases observed in both the complexes. During 2013-14 there were no fatalities at any of our units. The table below shows the statistics for other indicators of safety at NALCO:

Location	Category	Reportable Accidents	Man-Days Worked	Man-Days Lost	Man-Hours worked	Lost Day Rate	Rate of Injury	Absentee Rate
Smelter	Employees	3	6,77,552	133	54,20,416	0.0196	0.553	24.537
	Contractual Labour	2	13,83,928	86	1,10,71,424	0.0062	0.181	7.77
Refinery	Employees	NIL	4,97,847	0	39,82,776	0	0	0
	Contractual Labour	NIL	3,87,593	0	31,00,744	0	0	0
CPP	Employees	NIL	4,91,798	0	39,34,384	0	0	0
	Contractual Labour	4	8,02,987	155	64,23,896	0.019	0.622	24.12
Mines	Employees	NIL	1,36,327	NIL	10,90,616	0	0	0
	Contractual Labour	NIL	1,10,187	NIL	8,81,496	0	0	0
Port	Employees	NIL	13,780	NIL	1,10,240	0	0	0
	Contractual Labour	NIL	16,527	NIL	1,32,216	0	0	0

There were 154 education/training/counselling/prevention/risk-control programs conducted in 2013-14 to assist workforce members, their families, or community members regarding serious diseases. During the year, 4 First-Aid training programmes covering 106 employees (206 mandays) and 50 safety training programmes covering 1180 employees (1185 man days) were organized.

..... Human Rights & Ethics

Taking care of our people & respecting & protecting human dignity is one of the core values of NALCO. Our approach to Human Rights is guided by our sustainable development policy. All our production units and Corporate Office are SA 8000 certified. The Social Accountability policy highlights our commitment to provide a conducive work environment for all our employees and uphold ethical business practices by respecting human rights.

We communicate our Human Rights ideology to all our business associates before finalising agreements with them and consider it a minimum standard abiding by which is deemed non-negotiable. Clauses to this effect are incorporated in selected purchase enquires. NALCO prohibits any form of child labour in its own operations as well as at supplier's end. It also strongly prohibits any kind of forced/ compulsory labour in the organisation under any circumstances.

An SA 8000 based questionnaire has been formulated to screen all vendors on various human rights and social accountability aspects. Agreements and tenders are executed in compliance with relevant statutory obligations and national laws.

In order to eliminate risks of child labour & forced/compulsory labour in our supply chain, as a part of our procedure, SA 8000 questionnaire are sent with two-part bidding enquires

to all the prospective bidders. During 2013-14, SA 8000 filled up questionnaire have been obtained from approximately 100 bidders. Approximately 20 suppliers were visited by Purchase Officers to check for SA 8000 compliance. At all our operations, we have enforced strict measures to ensure that none of them employs child labour/forced/compulsory labour through various systems & processes and we are happy to report zero instances of the same.

Our mines and Alumina Refinery operate in a tribal dominated area. A detailed Resettlement & Rehabilitation plan was laid out and all the facilities were provided to these people as per this plan to support them physically & financially.

We conduct regular training programmes to train employees on human rights and socially accountable policies. During induction, minimum half a day training on SA-8000 is imparted to the executive and non-executive staff, covering various aspects of human rights. As on date almost all the executives and most of the non-executives have received training on SA-8000.

NALCO has a comprehensive "Code of Business Conduct & Ethics for Board Members and Senior Management", Fraud Prevention Policy, Whistle Blower Policy & "Conduct, Discipline and Appeal Rules" which govern matters related to corruption. Set of "Standing Orders" are applicable for all. To bring further transparency in procurement, an Integrity Pact has been adopted.

The policies extend to everyone with whom the organization is associated and govern the behaviour of employees, suppliers, contractors,



customers and other third parties who work with NALCO.

With regard to the provisions of Right to Information Act (RTI), a Public Information Officer responsible for providing information sought by stakeholders is appointed. During 2013-14, 199 queries were received including pending 19 queries from previous 2012-13. Out of this, 184 queries have been settled and remaining 15 are in different stages of addressal.

During financial year 2013-14, 105 vigilance complaints were received. In addition to this, 46 complaints were pending from previous financial year. As on 31.3.14, out of total 151 complaints, 127 have been resolved satisfactorily and 24 are at different stages of investigation. Based on vigilance investigations, charges could be established against 52 employees 14 employees were issued suitable caution letter and 8 employees have been issued charged memorandum by the respective disciplinary authority.

Based on investigations, suggestions have been incorporated in the system for ensuring improvement & transparency. There number of investor complaints received during 2013-14 was 97, all of which have been successfully resolved.



WAY FORWARD...



Aluminium outlook for 2014-15 appears positive with consumption expected to grow by 6%. India's per capita aluminium consumption has been quite low compared to the world average; it is therefore expected to improve aided by growth in the construction and power sectors as well as a pick-up in the automobile segment.

NALCO has adopted vision 2020 to become a reputed global company in metals and energy sectors. The Corporate Plan drafted in 2009 enumerates NALCO's plans to expand in alumina and aluminium sectors in India and abroad, to diversify into power sector and to look for business opportunities in other metals. With its enlarged vision, NALCO is concentrating on three key directions to achieve its goals for future Globalisation, Diversification and Growth. As one of the largest Aluminium producers, we have geared up to cater to this increase in demand and the following plans have been lined up:



- NALCO has been pursuing to set up 1 MTPA alumina refinery in Kutch district of Gujarat based on supply of bauxite from Gujarat Mineral Development Corporation's (GMDC) mines
- A Smelter & Power complex envisaged to come up at Sundargarh, Odisha, has received clearance of State Govt. To make this viable, NALCO is trying for coal block allocation
- As a part of backward integration, NALCO plans to set up 2 Lakh TPA caustic soda plant at Dahej in Gujarat in JV with GACL
- Aluminium and aluminium alloy conductors are being set up for which the Techno-Economic Feasibility Report (TEFR) has been made. Govt. of Odisha has made in-principle allocation of 30 acres of land in the Angul Aluminium Park.
- Opportunity to set up a Greenfield aluminium smelter in a country is being explored, where energy

would be available at a competitive price to make the project viable.

- Planning to set up a 14 MW wind power project in mined out area of its bauxite mines in Damanjodi.
- Planning to set up 100MW wind power project and 15 MW solar power plant at an estimated investment of Rs. 660 crore and Rs. 120 crore, respectively.
- After successful completion of 160 kWp roof-top solar plant at Corporate Office and 100 kWp roof-top solar plant at NALCO nagar township, Bhubaneswar, NALCO is also undertaking feasibility study to establish ground mounted and roof top solar power project at the NALCO Research & Technology Centre (NRTC) at Bhubaneswar and Smelter Plant & Township at Angul.

With the change in the business scenario, NALCO intends to review and revise its Corporate Plan to align to the demands of the present time. A new Corporate Plan 2020 will be formulated soon.

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GLOSSARY

BFP - Boiler Feed Pump

CHP - Coal Handling Plant

CISF - Central Industrial Security Force

CTE - Chief Technical Examiner

MCL - Mahanadi Coalfields Ltd.

TPM - Total Productive Maintenance

V2O5 - Vanadium Pentoxide

NLDC - National Load Despatch Centre

IUCN - International Union for Conservation of Nature

BSE - Bombay Stock Exchange

MOU - Memorandum of Understanding

EIA - Environment Impact Assessment

LED - Light Emitting Diode

IREDA - Indian Renewable Energy Development Agency

ISO - International Organisation for Standardisation

REC - Renewable Energy Certificate

RDC - Revenue Divisional Commissioner







नालको  **NALCO**

Nalco Bhawan, P/1, Nayapalli, Bhubaneswar-751 013, India

Phone: 0674-2301988 to 2301999 Fax : 0674-2300521/2300580

E-mail: info@nalcoindia.com Web: www.nalcoindia.com