



# **Investor Presentation**

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# **BALCO - KORBA**

# **BALCO : An Introduction**



- Started in 1973 with a capacity of 100 ktpa
- Fully Integrated Aluminum Complex comprising of
   -Alumina refinery, Soderberg (VSS) smelter and Fabrication Plant
- 270 MW Power Plant
- Privatisation in 2001 : Vedanta acquired majority stake

#### Journey 2001 Onwards ...

- Setting up of 245 ktpa Pre baked technology smelter and 540 MW CPP
- Achieved full capacity and stabilization of the new operations
- Continuous improvements to achieve benchmarking parameters
- Next Phase of expansion consisting of 1,200 MW Power Project and 325 ktpa Pre baked smelter underway: Coal block of 210 million tonnes reserves
- 100 ktpa Soderberg smelter dismantled in favour of more environment friendly and energy efficient 325 ktpa Pre baked smelter under construction currently

# **BALCO : Smelter**





# **BALCO : Pot Room**





# **BALCO : Carbon Plant**





## **BALCO : Power Plant – CPP 540 MW**







- Hot metal production from Pre baked smelter expected to be 255 ktpa in 2010-11 against a nameplate capacity of 245 ktpa (104 % capacity utilization)
- 540 MW Power Plant currently operating at 100 % PLF
- Continuous enrichment of product mix (Value added Aluminium Product 92% in FY 2010-11 as against 80% in FY 2009-10)
  - ➢Rod production 165 kt as against 148 kt
  - ➢Rolled product remains at 66 kt
- Current COP: \$1,750–1,800 per tonne .



#### Key drivers for COP reduction

- Reduction in specific power consumption
- Current increase and improvement in Current Efficiency
- Captive mining from coal block
- Continuous improvement in Logistics
- Manpower rationalization initiatives to continue
  - Rightsizing of regular manpower by over 1,000 persons as compared to 1st April 2009 through initiatives like VRS etc.
  - Current hot metal cost consist of \$60 per tonne on account of surplus manpower of dismantled soderberg smelter

### ACCOLADES



- Silver certificate of Excellence India's Manufacturing Excellence award 2010
- International Green Apple Award for Environmental Best Practice Silver Winner 2009 BALCO Fuse Technology.
- Ideas UK 2009 For installation of Bath Hopper in GAMI pot Superstructure
- Ideas UK 2009 Highly Commended Certificate (Innovation Category Online Pot Cut –out)
- National Safety award from DGSASLI
- Institute of Engineer's award (safety innovation award)
- First Prize in Reclamation & Rehabilitation Bodai daldali Mines
- Second Prize in Reclamation & Rehabilitation Mainpat Mines
- First Prize in Waste Dump Management Mainpat Mines
- Annual Safety week award for Bodai daldali Mines and Mainpat Mines (4 first award in various categories)
- Shrishti Good Green Governance Runner-up Award 2009 Power Plant and Aluminium Plant



Aluminium Reduction Cell Online cut out of pot (India as well as US Patent)

-With the innovation of this technology it was possible to cut out pots at full load thereby eliminating pot abnormality in terms of operating conditions due to power outage taken for pot cutout and no production losses due to any reduction in line amperage during cut out of pots

Aluminium Reduction Cell Fuse Technology (India as well as US Patent)

-Balco developed a fuse, with which it is possible to power on pots at full load without reducing the lime amperage to 0 KA. This innovation was critical to reduce the production losses during the power outages, disturbances to operations and undisturbed stable power plant operation.



# Aluminium Smelter 325 ktpa & 1,200 MW Power Plant - BALCO

## **SMELTER EXPANSION PROJECT**



#### Capacity – 325 ktpa

#### Pot Room

- No. of pots 336
- Pot amperage 340 KA

#### **Cast House**

- Ingot Casting 150 kt
- Wire Rod 200 kt



## **POWER EXPANSION PROJECT**



Capacity - 1,200 MW (4x300 MW)

Synchronization Schedule

- Unit # 1 Q 1 FY 2011-12
- Unit # 2 Q 2 FY 2011-12
- Unit # 3 Q 4 FY 2011-12
- Unit # 4 Q 1 FY 2012-13

Connectivity to National Grid through 400 KV transmission line - Target Completion : March 2011

## **CAPTIVE COAL BLOCK**



- Durgapur II Taraimar, Tehsil Dharmjaigarh, District Raigarh (C.G.)
- 70 km away from Korba
- Reserves 211 million tonnes

#### Major Mile Stones Achieved :-

- TOR approval by MOEF
- Mining plan approved by Ministry of Coal
- In-principle mining lease approval by state government
- Administrative approval of mining lease by central govt.
- In-principle clearance of forest diversion
- Public hearing for environment clearance



# **Aluminium Smelter - Jharsuguda**

# Jharsuguda – Bird's Eye View







#### Location Advantage

- Proximity to coal mines for cost efficient power generation
- Well connected by road and rail
- Close to eastern ports
- Proximity to Lanjigarh Alumina source

#### Capacities

- 2 lines of 304 pots each, adding to 500 ktpa and 1,215 MW CPP
- 4 lines of 336 pots each, adding to 1,250 ktpa

# Aluminium smelter – 500kt & CPP – 1,215 MW (Operational)



- Pot Room:
  - No. of lines 2
  - No. of pots in each line 304
  - Pot amperage 320 KA
  - Metal production 500 ktpa
- State of Art GP -320 kA potline technology
- 1,215 MW Captive Power Plant
  - 135 MW\* 9 units
  - Coal based

- KPS as maintenance partner



# Aluminium smelter expansion – 1,250kt



- Pot Room:
  - No. of lines 4
  - No. of pots in each line 336
  - Pot amperage 340 kA
  - Metal production 1,250 ktpa
  - Project completed 80 %



# Aluminium: Positioning on Global Cost Curve







- Common package for basic and detail engineering
- Parallel engineering, procurement & construction
- Proven track record of completing projects in time and within budget
- Large packages to minimize interface & take advantage of economies of scale
- Involving the vendors / EPC suppliers in the Scope optimization
- Optimizing on time and cost by guiding Foreign vendors to partner with Indian suppliers for sourcing
- Extended support to vendors & contractors during execution
- Continuous project review mechanism & taking pro-active remedial action
- Project pre-audit & review mechanism
- Community participation –involvement and job creation opportunities for local community
- Effective Project Monitoring through Primavera software



- For VAL 500 ktpa Alumina requirement of 1,000 ktpa
- 480 ktpa Alumina will be sourced from Lanjigarh Refinery through BTAP transportation
- Balance 520 ktpa has been planned through Import via Vizag & Kakinada ports
- Handling facilities at Port being upgraded



# **Commercial Energy**

# Vedanta's Competitive Advantage in Energy



#### Experienced management with project track record and mining expertise

- One of India's major energy producers
- Procurement expertise
- Access to capital
- Operating power plants with capacity of 3,934MW
  - Building and managing plants since 1997
  - More than 90% of current capacity is thermal
  - 5,570MW CPP+IPP under construction

#### Ability to minimise capital costs and maximise efficiencies

- Existing power plants operating at more than 95% PLF.
- Building new capacity at an average project costs of \$925/kwh against a global benchmark of \$1,500-\$2,000/kwh

# Commercial Energy - Sterlite Energy Limited



Jharsuguda 2,400 MW	SEL capacity	(MW)		
■Synchronisation – Unit 1: Q2 FY 2010-11	■ Jharsuguda 2,400 MW			
- Unit 2: Q3 FY 2010-11 - Unit 3: Q2 FY 2011-12 - Unit 4: Q3 FY2011-12	Talwandi Sabo	o 2,640 MW		5,040
■Fuel arrangements -65% Coal linkage -25-30% E-Auction/ Forward E-Auction -5-10% Imported Coal				
<ul> <li>Off Take arrangements</li> <li>– First unit to Grid</li> <li>– Balance in Merchant Market - 60% under Short term sales agreement, 40% spot</li> </ul>			3,060	2,640
Talwandi Sabo 2,640 MW         Synchronisation         - Unit 1: Q4 FY 2012-13         - Unit 2: Q1 FY 2013-14         - Unit 3: Q2 FY 2013-14         - Unit 4: Q3 FY 2013-14	1,200	2,400	660	
<ul> <li>Fuel arrangements <ul> <li>Coal linkage in place for 1,980 MW</li> </ul> </li> <li>Off Take arrangements <ul> <li>1,980 MW to Grid</li> <li>85% of balance 660 MW in Merchant Market and 15% to Grid</li> </ul> </li> </ul>	1,200 FY 2010-11c	2,400 FY 2011-12e	2,400 FY 2012-13c	2,400 FY 2013-14e

# **Snapshot – Jharsuguda Project**



	Key highlights
Gross Capacity	2,400 MW (4 units x 600)
Technology	Thermal, Sub-critical
Fuel Sourcing	<ul> <li>Coal linkages for the entire 2,400MW achieved</li> <li>112 million tons coal block allocated (~ Equivalent to Coal Consumption of 17 years for 1000 MW)</li> </ul>
Water Allocation	In place
Schedule	Synchronization Unit 1: Q2 FY 2010-11 Unit 2: Q3 FY 2010-11 Unit 3: Q2 FY 2011-12 Unit 4: Q3 FY2011-12
O & M Contract	Evonik GmbH, Germany





# **Snapshot – TSPL Project**

	Key highlights
Gross Capacity	2,640 MW (4 units x 660)
Technology	Thermal, Super-critical
Fuel Sourcing	Coal linkages is in place
Water Allocation	<ul> <li>Allocation in place. Conveyance &amp; Reservoir work started</li> </ul>
Land	Formalities Completed & acquisition under process
Railway Siding	Siding & rail network development are in progress
Evacuation Capacity	400 KV 3 lines with double circuit is under construction. Same will be sufficient to evacuate total Power of all 4 units.
Construction Status	<ul> <li>Construction activities in full swing. 7 out of 32 shipments received.</li> <li>Boiler structure erection started.</li> </ul>
Schedule	Synchronization Unit 1: Q4 FY 2012-13 Unit 2: Q1 FY 2013-14 Unit 3: Q2 FY 2013-14 Unit 4: Q3 FY 2013-14





# Jharsuguda-Township at a glance





# **Quality of Life at Jharsuguda Township**







# Alumina Refinery - Lanjigarh



# Orissa has huge, high quality Bauxite Deposits



- Orissa has vast reserves of high quality bauxite reserves
  - 1,442 Mt of recoverable deposits
  - 56.5% of India's bauxite reserves
- Bauxite deposits located within 60 km radius of Lanjigarh
  - Deposits of over 900 Mt
  - Predominantly gibbsitic, amenable to low temperature/low pressure digestion
  - Low reactive silica content, which results in low cost alumina production
  - Very little overburden which keeps cost of production very low
- Orissa also has abundant coal reserves
  - 62 billion tonnes
  - Low cost of power generation

# **Location Map: Refinery**





# Lanjigarh Project Profile



- Imtpa Alumina Refinery consisting of two streams
- MoU with Government of Orissa to provide 150 mn tonnes of bauxite
- 90MW (3x30MW) coal fired co-generation power plant
- Associated infrastructure
  - ➤Railway link
  - ➢Port infrastructure
  - ➤Water supply
  - ➢Power Link for black start up
  - ≻Township

# **Present Status**



- Both the streams commissioned and stabilised. Design flow equivalent to name plate capacity achieved.
- Achieved 95% Plant availability.
- Alumina quality as per best international norms achieved.
- Zero effluent discharge system implemented.
- All statutory environmental requirements met.
- ISO-9001,14001, OSHAS-18001 accreditation obtained.
- 5 mn tonnes expansion project on hold 100% Procurement and 60% construction completed
- All raw materials and Alumina are being transported by Rail
# Lanjigarh Plant- At a glance





## Lanjigarh Plant- At a glance







## Lanjigarh Township- At a glance







# Health, Safety, Environment

Safety : Approach: Counselling , Coaching and Facilitating 😻 vedanta

■Qualified Safety Officer for each SBU. Implementation strategy – top driven

Centralised Safety Team to drive the safety culture of line management

Managers & Supervisors trained on safety systems

Regular Toolbox meetings & Senior management participation in plant walk down

Motivation anchored through reward & recognition

Engaged "Du-Pont" for site sensitization & system implementation

### **BALCO - Environment Initiatives**



#### **Energy Conservation**

■Due to continuous energy conservation initiatives specific energy consumption has dropped by 6 % in 2010-11 as compared to 2009-10.

■Introduction of slotted anodes in place of ordinary anodes has reduced the carbon as well as energy consumption.

■Improvement in compressor efficiency to reduce auxiliary power consumption.

#### Water Conservation

■Due to continuous water conservation initiatives specific water consumption has reduced in 2010-11 as compared to 2009-10.

■Pre bake smelter plant is zero water discharge plant.

#### **Clean Technology**

■CDM Projects for emission reduction and energy efficiency improvement

■Audit by Cross functional team on 5-S & report given to Plant heads for action

■Greenbelt development in the Mines, tree plantation around the plant premises, township as well as in nearby areas.

### **Environment Management – Smelter**





### Fume Treatment Plant – Pot Rooms

- $\checkmark\,$  Total Fluoride emission  $\,$  < 0.8 Kg/ton of Aluminium
- $\checkmark\,$  Online monitors for PM & HF in all the stacks

### **Aluminium Smelter :**

- ✓ State of the art dry scrubbing system is installed in pot rooms & bake ovens
- $\checkmark\,$  Adequate suction design to ensure 98 % gas collection efficiency.
- $\checkmark$  Fluoride removal efficiency of 99 % in FTP



Fume Treatment Plant – Bake Oven

### **Environmental Management – Smelter**





 ✓ IMS Certified Plant (QMS-ISO-9001, EMS-ISO:14001 and OHSAS: 18001 Certification obtained for Quality, Environment and Safety Management Systems)

- ✓ Effluent Treatment Plant (ETP) for removing Fluorides in smelter effluent
- ✓Zero Water discharge maintained

50000 sapling have been planted both inside the plant and in the nearby villages.



### **Environmental Management – Power Plant**



 ✓ Electro Static Precipitators of 99.98% efficiency to control particulate matter emissions below stipulated standard





- ✓ Stack of 275 m height to ensure wider dispersion of emissions
- ✓ Online monitors for PM,SO2,NOx & CO in all the stacks
- ✓ High Concentration Slurry Disposal for Ash Disposal



# People

### People



- Total Strength
- At BALCO: 4,370 employees of which 820 engineers, 1,090 fresh graduates, 70 CAs & MBAs & 2390 non graduates.
- At Jharsuguda: 3,000 employees of which 1,500 engineers, 1,400 fresh graduates & 150 CAs & MBAs.
- \* At Lanjigarh: 650 employees of which 350 engineers, CAs & MBAs & 300 fresh graduates
- Recruited specialists / experts from the best smelters & power plants across the world such as Dubal, Alba, Mozal and Comalco.
- Continuous learning & development environment
- Engineers getting trained at Global Aluminium Smelters & Power Plants
- Synergy between VAL & BALCO People
- Focus on asset optimization and process improvements through Six Sigma
- ERP Implementation SAP Implemented
- Best practices in place, SBU Concept, Attractive short term & long term awards (ESOPs)
- Reward schemes at Company Level : Production Incentive & Individual Level : CEO Kitty, Star of Business

## **Corporate Social Responsibility**





#### Vedanta resources plc

# **Empowering Communities**



## **Our Vision: To enhance the quality of life &** economic well-being of communities



& Livelihood

Agriculture &

### **Our Approach**

Embedded in our business philosophy with well defined governing structure & policy.	Social Investment – Health, Education
<ul> <li>Continuous Stakeholder engagement and consultation</li> <li>Holistic, long term, integrated and sustainable</li> </ul>	Bio Investment – Water Harvesting, Social Forestry.
Planned & result-oriented approach with base line study, monitoring, impact measurement & social audits.	Integrated Village Development
3-5 year perspective with annual business plans for each geography.	
Partner with like minded associates, government, volunteer organizations & communities.	
■Dedicated CSR team.	

**Our Focus** 

### Empowering communities – impact & outcome : 2005-10



#### **Education**

- 53 company run /supported schools & colleges reaching out to 5,860 children.
- ■46,986 children covered by 1,021 Vedanta Bal Chetna Anganwadi Centers
- Computer Literacy program supported in 24 schools and covering 10,974 students.
- Literacy initiatives for over 1,329 children in 14 centers.

#### Health

- ■Vedanta Medical Research Foundation under progress at Raipur
- ■6 company run hospitals & health posts
- Outreach healthcare services provided to 0.2 million people
- 55,000 children, 445 schools covered under the midday meal program through 2 centralized kitchens





### Sustainable Development – impact & outcome : 2005-10



#### Livelihood

- 5,014 acres of land brought under cultivation & watershed for 1,797 farmers
- ■7,238 women, 596 Self Help Groups
- 4,561 entrepreneurs trained through 204 number of trainings conducted through skill development training.

#### **Our Reach**

- Strategic focus on 393 villages, 0.39 million people in 2 States in India.
- 17 villages covered under the Integrated Village Development Program
- CSR Advisory Board in Orissa to guide & assess CSR performance
- Team: 33 NGO partners, 35 CSR personnel and 19 extension workers
- ■CSR investment over 5 years INR 143.8 crore.







### CSR

- International Green Apple Silver Award for best Environmental Practices & Sustainable Development BALCO.
- ■2008- HIV /AIDS award by TERI- GTZ BALCO
- ■2008 Corporate with best CSR Practice by TEFLAS VAL
- ■2009 Golden Peacock CSR Award. BALCO
- ■2009- HIV /AIDS award by TERI- GTZ BALCO
- ■2009 Best corporate recognition for HIV/AIDs Control by CG Society of AIDs Control Chhattisgarh.
- ■2010 Asian HRD Congress award for Special Education initiative. VAL
- ■2011 CIDC ViswaKarma award for CSR BALCO



### <u>Jharsuguda</u>

- IPP (2400 MW)
- New Smelter (1250kt PA)
- Existing Smelter (500kt PA)
- CPP (1215 MW)



### Safety guidelines for Plant Visit

- Requested to follow the guided path & do not enter in to restricted areas
- PPEs shall be provided to you, kindly use it
- Helmet, Gloves, Glasses and Shoes are basic minimum safety requirement for all areas of the plant
- You are requested to follow the Leader during the site visit
- Magnetic Field in Pot Rooms
- $\checkmark$  No analog watches
- ✓ No magnetic cards (e.g. Credit cards)
- $\checkmark$  Persons having pace makers are not allowed
- Noise Use ear plugs in noisy areas like turbine floor

## HAVE A SAFE VISIT



