



# Investor Presentation 25<sup>th</sup> Sep 2012

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### India's Mining Potential





### Vedanta well positioned to develop and benefit from India's resource potential

\* Source Wood Mackenzie

### Orissa has huge, high quality Bauxite Deposits



- Orissa has vast reserves of high quality bauxite
  - 1,442 mt of recoverable deposits
  - > 56.5% of India's bauxite reserves
- 900+mt bauxite deposits located within
   60km radius of Lanjigarh
  - 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 low
- Orissa also has abundant coal reserves
  - > 62 billion tonnes
  - Low cost of power generations



### **Coal Reserves**



- India has the 4th largest reserves of coal across the world which is approximately 284.37 billion tonnes out of which 69.15 billion tonnes reserves are located in Orissa (Source: coal.gov.in).
- India is also the third largest producer of coal across the world of approximately 585 Mt per Annum (Source: worldcoal.org).
- Mahanadi Coal Fields (MCL) in Orissa and Southern Eastern Coal Fields (SECL) in Chhattisgarh are the major coal producers.
- ✤ MCL & SECL Annual Production during the year 2011-12 was 218.16 Mt.
- Ministry of Coal has issued directives dated 17th February 2012 to Coal India Limited for signing of FSA with 80% allocation of LOA quantity for Power Plants having long term PPAs.
- Ad hoc quantity allocation by CIL at Linkage rate for power producers, out of historical stock built-up. SEL has been offered 3mt coal for FY2012-13.
- ✤ Reduction in custom duty on imported coal (from 5 % to 1 %).
- ✤ E auction prices lower in response to lower global coal costs.

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### **Global Alumina Cost Curve**



### **Global Aluminium Cost Curve**





Aluminium Smelter Costs (C1 Cash Cost Curve)

Cumulative Production (Percentile)

### Vedanta Aluminium & Power Business





Premium Benchmarking – Premium over LME (Primary Metal)







# **Product Mix Benchmarking**





# **Project Cost Benchmarking**



1.	PROJECTS		PROJECT COST
	Aluminium	1.75 mtpa	\$ 4370 MIN USD
	Captive Power	1215 MW	\$ 950 Mn USD
	Alumina	5.0 mtpa	\$ 2585 Mn USD
2.	TECHNOLOGY & EQUIPMENTS:		
	Comparable to all best global p	lants.	
3.	PROJECT COST COMPARISON O	<b>OF GLOBAL PROJECTS</b>	WITH OUR PROJECTS:
	a) Aluminium:		
	Sohar Aluminium, Oman	2.07 times	
	Alcan, Kitimat Canada	3.15 times	
	EMAL, Abu-Dabi	2.20 times	
	Maaden, Al Jubail	2.44 times	
	b) Alumina:		
	Alunorte, Brazil	1.42 times	
	Alcan, Gove (Australia)	2.62 times	
	Utkal, Tikri (India)	2.16 times	
	c) Captive Power:		
	Jindal Power, Raigad	1.28 times	
	KSK, Wardha	1.16 times	
	Reliance, Rosa	1.50 times	
	India Bull, Amravati	1.58 times	
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# In the Current Scenario these prices have gone up by more than 20%



# **BALCO - KORBA**

## **BALCO : Pot Line**













### Production

- Hot metal production from Pre bake smelter at its rated capacity
- Continuous enrichment in product mix (Value added Product Aluminum Rods and Rolled Products)
  - ➢ 2010-11 89 %
  - ➢ 2011-12 96 %
- Hot Metal Production cost of \$1,910/t in Q1 FY2013.
- Net effective premium over LME :
  - FY 2010-11 \$ 306 / MT
  - FY 2011-12 \$ 312 / MT

# Way Forward towards enhanced cost competitiveness



### Key drivers for COP reduction:-

- Current increase and further Improvement in Current Efficiency.
- Mining from captive coal block.
- Continuous improvement in Logistics.
- Manpower rationalization initiatives to continue in order to reach global benchmarks.
  - > Achieved 30 % reduction in manpower as compared to April'09 through IT enablement,

deployment of technology and work flow optimization.

### **Recent Accolades**



- Winner of International Green Apple Award, UK, for Innovation (2012, 2010 and 2009)
- IMC Ramakrishna Bajaj National Quality Award- (2011, 2010)
- Indian Manufacturing Excellence Award- (2011, 2010, 2009)
- CII- environmental Best Practices award (2011)
- Best Prax Management Governance Award- First prize for Risk Mitigation (2011)
- Shrishti Good Green Governance Commendation Award- (2011, 2010)
- Qimpro Six Sigma Convention- First prize (2011)
- CIDC Viswakarma Award for commendable work in CSR (2010)



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 line amperage to 0 KA. This innovation was critical to reduce the production losses during the power outages, disturbances to the operating pots and for stable power plant operation. US Patent Received.

Aluminium Reduction Cell Online cut out of pot (US Patent Pending)

-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 Smelter 325 ktpa & 1200 MW Power Plant - BALCO

# **Smelter & Power Expansion Project**



#### **SMELTER:**

Capacity – 325 ktpa

#### Pot Room

- ✤ No. of pots 336
- Pot amperage 340 kA

#### Cast House

- Ingot Casting 150 kt
- ✤ Wire Rod 200 kt

### POWER:

Capacity - 1200 MW (4x300 MW)

### Synchronization Schedule

- ✤ Unit # 1 Q 3 FY 2012-13
- Connectivity to National Grid through 400 KV transmission line completed



# **Captive Coal Block**



211mt reserves at Durgapur II Taraimar Block, 70 km from Korba

### 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.
- Environment clearance granted by MOEF.
- Stage-I Forest Clearance obtained.

### **Next Steps**

- Stage-II forest clearance
- Mining lease execution
- Commencement of mining operations



# **Alumina Refinery - Lanjigarh**

# Lanjigarh Project



- 1.0MTPA Alumina Refinery consisting of two streams
- Government of Orissa committed to provide 150 Million T 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

## **Location Map: Refinery**





### **Present Status**



- Plant fully commissioned & stabilized.
- Achieved 95% Plant availability.
- Alumina quality as per best International norms achieved.
- Zero discharge system implemented.
- ✤ 100% material transportation by Rail.
- ✤ ISO-9001,14001, OSHAS-18001 & En 50001 accreditation obtained.
- Zero Waste Projects are being implemented.

# Lanjigarh Plant- At a glance





# Lanjigarh Plant- At a glance





# Lanjigarh Township- At a glance







- ✤ National Award for Excellent Energy Efficient Unit in 2011 and 2012
- National Award for Excellent Water Management unit-2011
- St. John Ambulance Annual Award 2007-08
- ✤ FE –EVI, Green Business Leadership award 2009-10



# **Aluminium Smelter - Jharsuguda**

# Jharsuguda – Bird's Eye View





# Aluminium: Jharsuguda



### Locational 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

### Capacity

- 2 lines of 250 kt each, adding to 500kt and 1215 MW CPP
- 4 lines of 312.5kt each, adding to 1,250kt

### Aluminium smelter – 500kt & CPP - 1215 MW



- Pot Room:
  - No. of lines 2
  - No. of pots in each line 304
  - Pot amperage 330 kA
  - Metal production 500kt PA
- State of Art GP -330 kA Potline technology
- ✤ 1215 MW Captive Power Plant
  - 135 MW\* 9 units
  - Coal based
  - KPS as maintenance partner







# Aluminium smelter expansion – 1250kt

- Pot Room:
  - $\blacktriangleright$  No. of lines 4
  - No. of pots in each line 336
  - Pot amperage 340 kA
  - Metal production 1250kt PA
  - Project 90%+ completed







- For VAL 500kt PA Alumina requirement of 1061kt PA
- ◆ 480kt PA Domestic Alumina is sourced from Lanjigarh Refinery through BTAP transportation
- Balance through Import via Vizag & Kakinada ports
- To manage future volumes and effective handling of Alumina highly mechanized port facility is commissioned.

### Jharsuguda-Township at a glance







# **Commercial Energy**

### **Snapshot – Jharsuguda Project**



	Key highlights	
Gross Capacity	Gross Capacity	
Technology	<ul> <li>Thermal, Sub-critical</li> </ul>	
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	
EPC	✤ Contract with SEPCO	
Achieved Milestones	✤ 3 units Synchronized, 1 under trial run.	
O & M Contract	Entered in to the O & M contract with Steag Energy Services (India) Pvt. Ltd, A wholly owned subsidiary of Steag Germany, GmbH.	
Off Take arrangements	<ul> <li>First unit to Gridco</li> <li>Balance in Merchant Market - 80% under Short term sales agreement, 20% spot</li> </ul>	







### **Snapshot – Jharsuguda Project**

	Key highlights	
Evacuation capacity	<ul> <li>220kV interconnecting Transmission Line between CPP and IPP is completed and line is charged &amp; capable to evacuate 450 MW to State Grid.</li> <li>LILO 1 &amp; LILO 2 connectivity of 400kV IPP switch yard to PGCIL 400kv Transmission Line is completed . These Lines are capable of evacuating 1400 + MW to PGCIL National grid</li> <li>IB-Meramandli Restructuring of OPTCL line (+ 600 MW) – By completion of transmission line entire SEL Project shall be connected to 400 kV lines. Target Completion by March 2013</li> </ul>	
Railways Projects	<ul> <li>CPP &amp; Smelter #1 railway line is completed.</li> <li>CPP &amp; IPP interconnection is completed</li> <li>Y Connection from Brundamal Station &amp; lines for Wagon tippler for BOXN wagons unloading is also completed</li> <li>Railway connectivity from Dhutra is in progress and will be completed by September 2013.</li> <li>Captive railway siding from Basundra Mines will be completed by December 2015</li> </ul>	Image: State of the state o

### Snapshot – TSPL Project



	Key highlights	
Gross Capacity	✤ 1,980 MW (3 units x 660)	
Technology	<ul> <li>Thermal, Super-critical</li> </ul>	
Fuel Sourcing	<ul> <li>Coal linkages is in place</li> </ul>	
Off Take Arrangement	✤ All power to PSPCL	
Water Allocation	<ul> <li>Allocation in place. Conveyance system completed</li> </ul>	
Land	✤ Completed	
Railway Siding	<ul> <li>Siding &amp; rail network development are in advance stage of completion</li> </ul>	
Evacuation Capacity	Out of 400 KV 3 lines with double circuit, one double circuit line is complete and balance two are at advance stage. One line completed	



### Snapshot – TSPL Project

EPC	Key highlights	
EPC Construction Status	<ul> <li>Key highlights</li> <li>Engineering completed</li> <li>83% material received</li> <li>23 out of 28 shipments dispatched from China</li> <li>94% excavation completed</li> <li>75% concreting completed</li> <li>34% Erection completed</li> <li>Boiler Hydro Test expected by Nov'12</li> <li>Concreter Stater lifting completed</li> </ul>	<image/>
	<ul> <li>Generator Stator lifting completed</li> <li>400 KV Switchyard is ready for Priority Bay energization</li> </ul>	

# Manpower Distribution-Aluminium & Power



Unit	Manpower
Jharsuguda	2630
BALCO	1320
Lanjigarh	543
Total	4493

Education	Manpower
Graduate	2041
Engineer	1939
CA/ICWA	85
MBA	228
Others	200
Total	4493





#### # TSPL Manpower not included

# **Key Value Drivers**



Asset Optimization	Optimization of assets to achieve higher PLF & metal volume to get reduction in unit fixed cost.
Operational Efficiency	Improvement in current efficiency ,metal purity, power & other consumption to the global best. Stabilization and improvement in efficiency parameters such as coal consumption, PLF etc. to reduce generation cost.
Product Mix	Maximisation of production of value added products such as Billet, Wire Rods, Rolled Product etc. Focus on realization of benchmark premium to maximize the margin.
Power Sales	Maximisation of power NSR in open access to improve the overall power margin.
People	High performing organization. Attract, retain and reward talent.

# **Corporate Social Responsibility**





### Our Vision: To enhance the quality of life <u>& economic well-being of communities</u>



### **Our Approach**

- Embedded in our business philosophy with well defined governing structure & policy.
- Continuous Stakeholder engagement and Consultation.
- Holistic, long term, integrated and sustainable
- Planned & result-oriented approach with base line study, monitoring, impact measurement & social audits.
- 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

- Social Investment Health, Education & Livelihood
- Bio Investment Water Harvesting, Agriculture & Social Forestry.
- Integrated Village Development

### Empowering Communities Impact & Outcome : 2011-12

#### Education

- 40,000 children provided with hygienic and nutritious food in 351 schools through Mid Day Meal (MDM) Kitchen
- 50,000 children covered under Vedanta Bal Chetna Anganwadi Centers
- 651 school children provided with scholarship support to study in DAV Vedanta International School
- 429 school children of vernacular medium provided with special input in 10 schools resulting 72% passing rate in class 10<sup>th</sup> exam.

### Health

- Vedanta Rural Health Post caters services to 62 villages covering 66,000 people in interior villages.
- 69,000 population targeted under Reproductive and Child health project in 90 villages.
- Reaching to communities through hospitals and outreach programs covering more than 70,000 individuals
- Vedanta Medical Research Foundation under progress at Raipur







### Sustainable Development -Impact & Outcome : 2011-12

### Vedanta resources plc

#### Livelihood

- Enhanced livelihood opportunities by Water shed development initiatives developing 1499 hectares Land.
- Generated employment opportunities of 1750 youths annually by Skill upgradation training.
- Created sustainable livelihood avenue for 750 tribal families by developing orchard on barren and waste land.
- Promotion of on farm and off farm activities among 3100 families for sustainable livelihood.

#### **Community Plantation**

Plantation of 88,750 fast growing plants in 822 acres of land.



### **CSR Awards & Recognition**



- 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
- 2011 Best CSR Practice Award for Child Development & Employment Generation

### **Environment Initiatives**



### **Energy Conservation**

- Continuous energy conservation initiatives undertaken to drop specific energy consumption.
- Introduction of Fuse technology, slotted anodes, online welding, regular energy audits has reduced energy consumption.

### Water Conservation

- Due to continuous water conservation initiatives and regular audits, specific water consumption has reduced in 2011-12 as compared to 2010-11 further its in reducing trend in YTD 2012-13.
- All our units zero water discharge plant.

### **Clean Technology**

- CDM Projects undertaken for emission reduction and energy efficiency improvement are under registration process.
- Audit by Cross functional team on 5-S & reports are being reviewed by Plant Heads
- Greenbelt development in the Mines, tree plantation around the plant premises, township as well as in nearby areas.



### JHARSUGUDA

**♦**IPP (2400 MW)

♦NEW SMELTER (1250Kt PA)

♦ PLANT I (500Kt PA & 1215 MW)



- 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 who guides you during the site visit
- Magnetic Field in Pot Rooms
  - ➢No analog watches
  - ➢No magnetic cards (e.g. Credit cards)
  - ➢ Persons having pace makers are not allowed
- ✤Noise Use ear plugs in noisy areas like turbine floor

### Have a Safe Visit







# **Thank You**