



# GREENER

**STRONGER** 



**SMARTER** 

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# THE MATERIALS THAT BUILD THE FUTURE

Hindalco produces materials that create a greener, stronger, smarter, world. Its products sustain the environment, power the global economy and offer smart solutions for today and the future.

From infrastructure to aeronautics to seafaring vessels, Hindalco products find applications across land, sea and air. From new generation automobiles to aerospace and bullet trains, to innovations like tempered glass for the transformational mobile communication revolution. Hindalco leads from the front.

The metals from Hindalco, namely, aluminium and copper are green in more ways than one. Their use in electric vehicles or solar panels contribute to a sustainable planet.

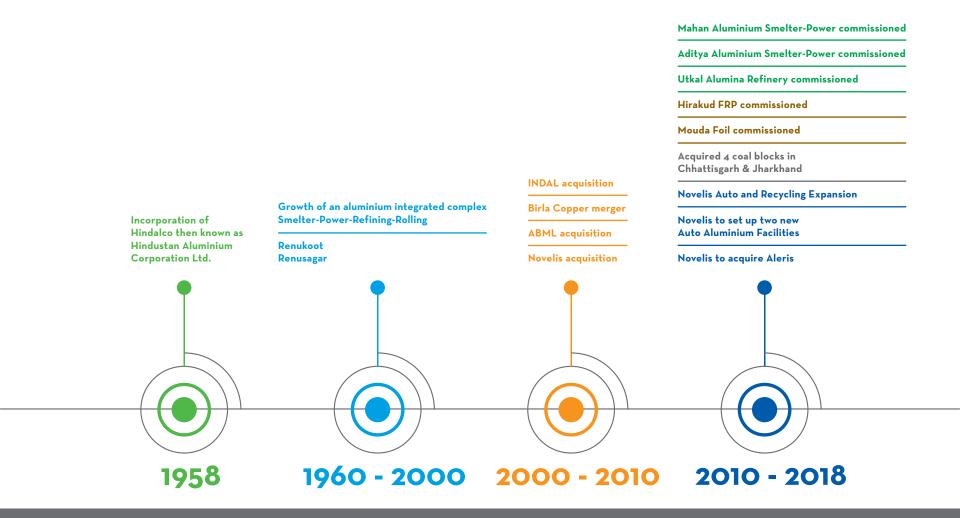
From mining to manufacturing, Hindalco cares for the environment at every stage. Combining advantages of lightweight and strength, recyclability and manufacturing excellence, strong research and development capability and a global talent pool, Hindalco today is big in your life.





# THE HINDALCO GROWTH STORY

Hindalco came into being from the vision of its founder the late G.D. Birla. The foundation of India's first integrated aluminium complex at Renukoot in the state of Uttar Pradesh, marked the beginning of the historic journey. Today, under the leadership of the Aditya Birla Group Chairman, Kumar Mangalam Birla, the Company has taken giant strides into the future. A transformational journey from a single unit in India to a global metals major, with a remarkable growth in revenues in the last 18 years.



### METALS FLAGSHIP OF A GLOBAL CONGLOMERATE

Hindalco is the flagship company of the Aditya Birla Group, a US \$44 billion corporation in the league of Fortune 500. The Group is anchored by an extraordinary force of over 120,000 employees, belonging to 42 nationalities. Over 50 percent of its revenues flow from its overseas operations spanning 35 countries. The Group was named the Aon Best Employer in India for 2018 — the third time in 7 years.



THE
LARGEST
ALUMINIUM
ROLLING
COMPANY
IN THE
WORLD

Hindalco is the industry leader in aluminium and copper metals. Headquartered in Mumbai, India, Hindalco, along with its wholly-owned subsidiary Novelis Inc., is the world's largest aluminium rolling company and one of Asia's biggest producers of primary aluminium. The state-of-the-art copper facility comprises a world-class copper smelter and a fertiliser plant along with a captive jetty.

The copper smelter is among the world's largest custom smelters at a single location.

Global Metals Powerhouse with Market Cap of

### **US \$8billion**

Revenue of

### **US \$18billion**

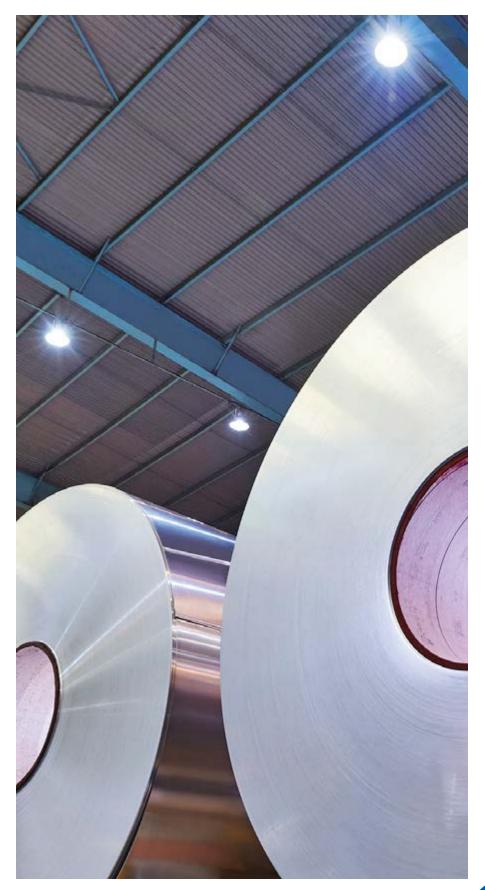
(₹1,15,809 crore)



# LOCAL & GLOBAL ADVANTAGES

Hindalco enjoys a leadership position in aluminium and downstream value-added products in India and overseas. The combined power of Hindalco and Novelis offers unique benefits, which are both local and global. It ranks among the lowest cost primary aluminium metal producers and is a leading player in value-added products of aluminium and copper.

Operational excellence in manufacturing, combined with backward and forward integration strategies provides a balanced business portfolio which strengthens Hindalco's global leadership position.





- Global leadership
- Operations in 44 manufacturing units across
   11 countries in 4 continents
- Multi-cultural workforce of around 36,000 across the globe
- Novelis world's number one producer of aluminium flat rolled products
- Integrated operations in India from primary aluminium smelting to rolling, with resource security through access to captive bauxite ore, coal mines and linkages
- Aditya and Mahan Aluminium Smelting Units — 1st quartile cost producers of world-class aluminium
- Utkal Alumina, a wholly-owned subsidiary of Hindalco, is a world-class Refinery — leader in technology, cost and quality
- Among the world's largest custom copper smelters at a single location

# Novelis

is a global leader in aluminium flat rolling and recycling

# UNBEATABLE RECYCLABILITY

70% of all aluminium produced since 1886 still in use today

# HINDALCO ALUMINIUM: MANUFACTURING EXCELLENCE Excellence by design is the mantra at Hindalco. It is

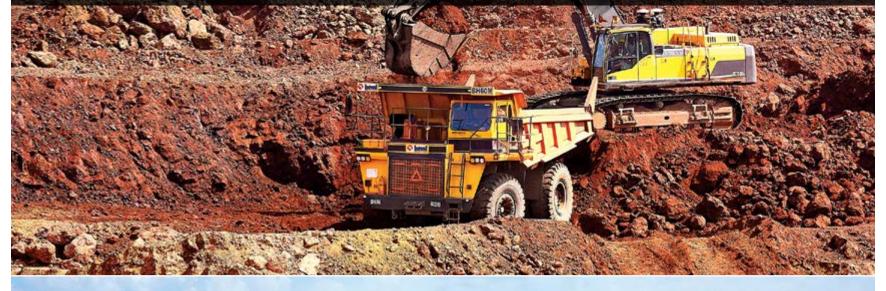
Excellence by design is the mantra at Hindalco. It is the underlying theme of the Hindalco Management Framework (HMF) — an effort to standardise processes as the Hindalco Way, in order to embed excellence and agility in every aspect of operations; ensuring quality, safety and long-term sustainability. With the commissioning of new technologies at the plants, new product applications and strong sustainable management practices, the positive transformation has gained momentum, towards customer delight and satisfaction every time, by rule and not by chance.



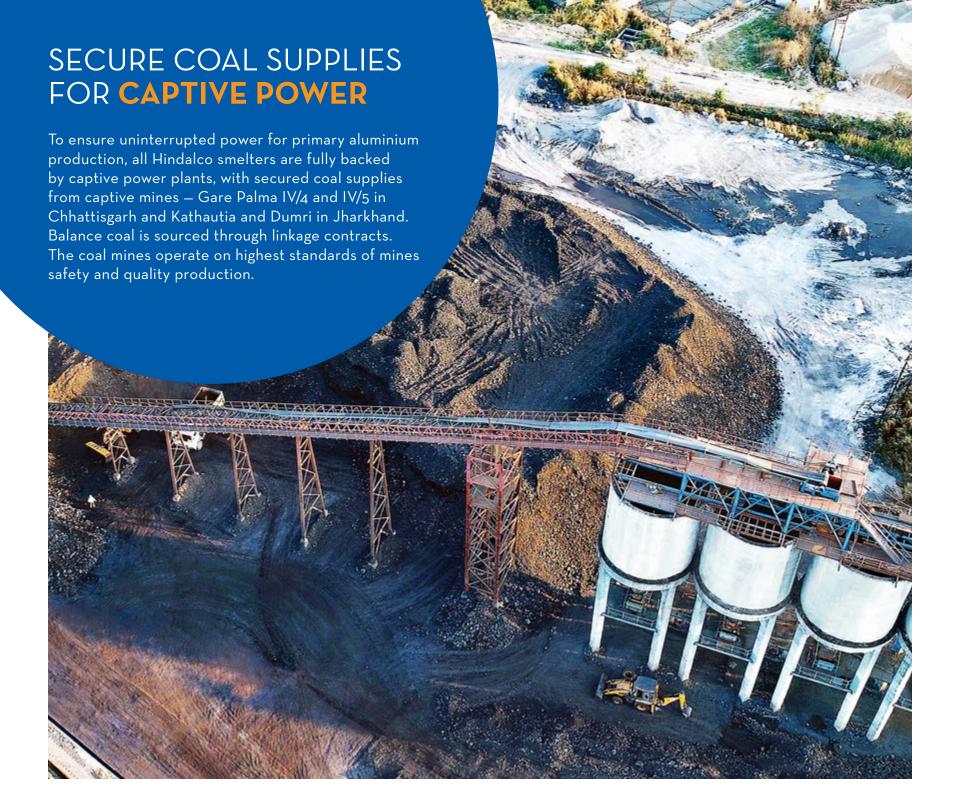
## **MINES: RESPONSIBLE RESOURCE MANAGEMENT**

The Company's captive bauxite mines in Jharkhand, Odisha, Chhattisgarh and Maharashtra provide the basic raw material to its alumina refineries located at Muri in Jharkhand, Renukoot in Uttar Pradesh and Belagavi in Karnataka. Utkal Alumina (Odisha) located in close proximity to Baphlimali bauxite mines has access to superior quality bauxite ore which is transported to the refinery through an 18 km long-distance conveyor, considered an engineering marvel. Alumina is the intermediary product in white powder form, for manufacturing of aluminium metal.

Hindalco's mining practices, regeneration activities and sustainable community engagement initiatives are geared towards minimising environmental impact and maximising socio-economic development of the surrounding regions.

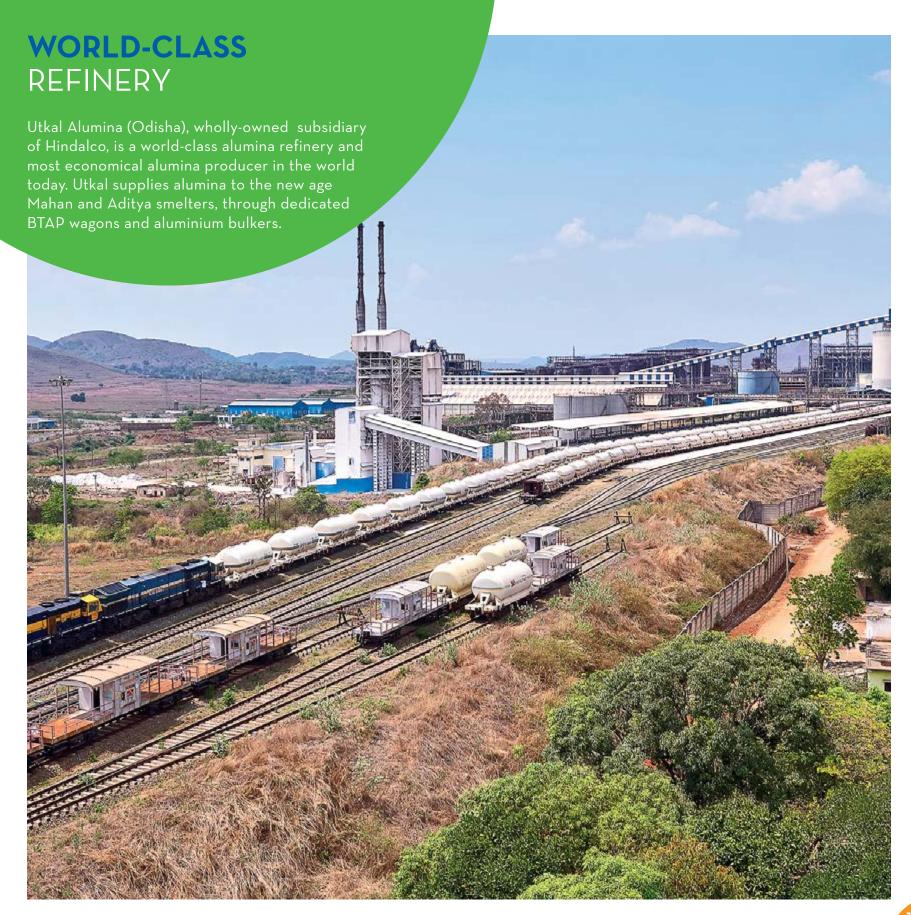


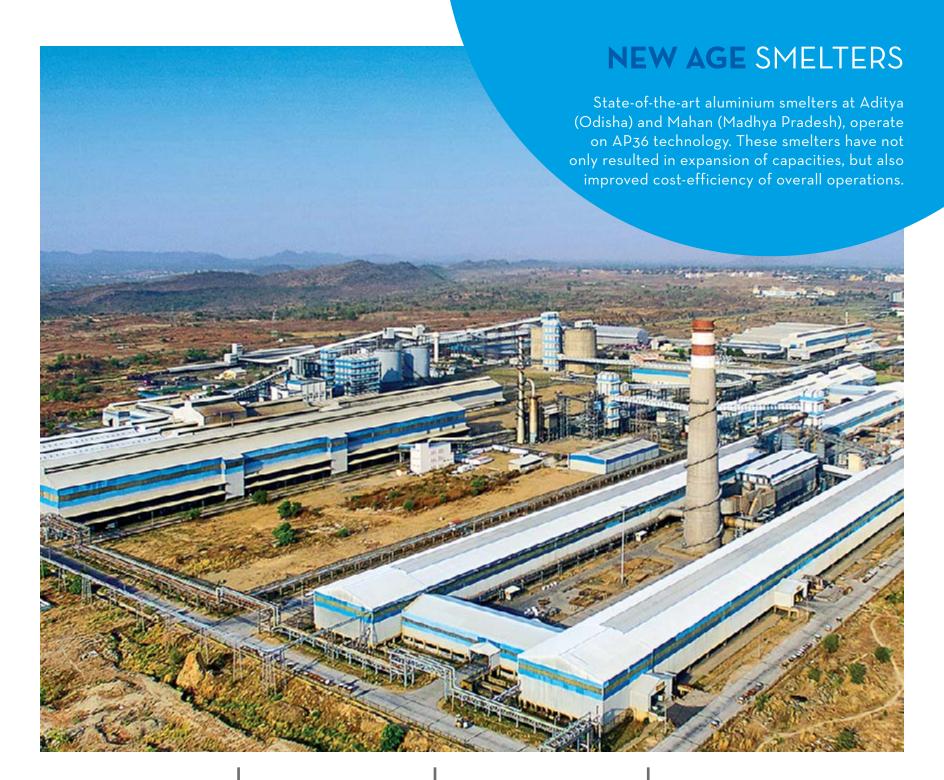




# RESOURCE AVAILABILITY

India has abundant bauxite and coal reserves which gives Hindalco unique stability in both production and capability. This enables the Company to visualise long term perspectives and stay ahead of new developments to meet emergent needs.





ALUMINA
Capacity
2.9 million tpa

ALUMINIUM
Capacity
1.3 million tpa

CAPTIVE
POWER GENERATION
Capacity
3,300 MW

DOWNSTREAM ALUMINIUM
VALUE-ADDED PRODUCTS
Shipment
3.7 million tonnes
(incl Novelis)

# PROMISE IN PRIMARY ALUMINIUM







Ingots and sows from Aditya and Mahan smelters are registered with the **London Metal Exchange (LME)** as good delivery brands. Mahan also has a patent for surface finish of their sows and ingots.

# **ROBUST GROWTH** IN FLAT ROLLED & EXTRUDED PRODUCTS

With world-class rolling facilities in Hirakud (Odisha), Renukoot (UP), Taloja, Mouda (Maharashtra), Belur (West Bengal) and Extrusions at Renukoot and Alupuram (Kerala), Hindalco is poised to lead the market in India towards newer applications in the aluminium segment.

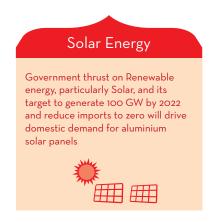
















# **LOW** CONSUMPTION **HIGH** POTENTIAL

India's historically low aluminium consumption of around 2.5 kg per capita as compared to around 24 kg per capita consumption in China and global average of 11 kg, is a great opportunity for growth in the domestic value-added products market.

A global standard in primary metal quality coupled with downstream rolling expertise to offer customised solutions, gives Hindalco a competitive edge to meet the growing global as well as local demand.

# MAJOR ALUMINIUM BRANDS

#### FLAT ROLLED PRODUCTS

Hindalco Everlast: Leading brand for aluminium roofing solutions. Preferred choice for industrial and residential applications.





#### FOIL AND PACKAGING

Freshwrapp, Superwrap and Freshpakk the Semi Rigid Container (SRC) are convenient and popular Hindalco brands.









#### **EXTRUSIONS**

Hindalco Extrusions (HE) offers an impressive range of shapes and alloys.

Maxloader all-aluminium truck body made up of HE profiles offers many cost-saving advantages.

ETERNIA Quality window and door systems of superior Italian design. Beauty and engineering come together seamlessly.



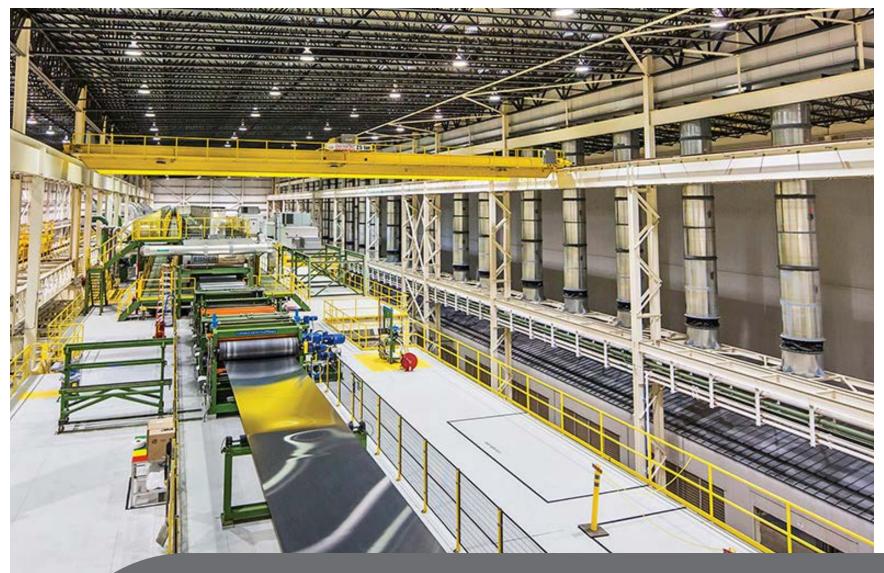












NOVELIS
ALUMINIUM:
RESPONSIBLE
LEADERSHIP

Over the last decade, Novelis has grown to become the leading producer of flat-rolled aluminium products and the world's largest recycler of aluminium. Driven by its purpose to shape a sustainable world together, Novelis works alongside its customers to provide innovative solutions for beverage cans, automotive and high-end speciality markets. As a world-class business-to-business manufacturer, Novelis is proud to

serve some of the largest and best known brands in the world, such as Coca-Cola, ABInBev, Ford Motor, Jaguar Land Rover, LG and Samsung.

Operating a global network of technically advanced rolling and recycling facilities across North America, South America, Europe and Asia, Novelis leverages its global manufacturing and recycling footprint to deliver consistent, high quality products around the world.



INNOVATION: MICRO TO MACRO

Novelis' expert team of engineers, metallurgists, chemists and scientists have set the standard for aluminium alloy innovations. Owning more than 140 automotive-specific patents, Novelis is committed to continuing to lead the industry in developing aluminium solutions for its customers. Novelis' 11,000+ employees worldwide are the driving force behind its forward-thinking innovation and it is their talent that sets Novelis apart as a 21st century manufacturer.

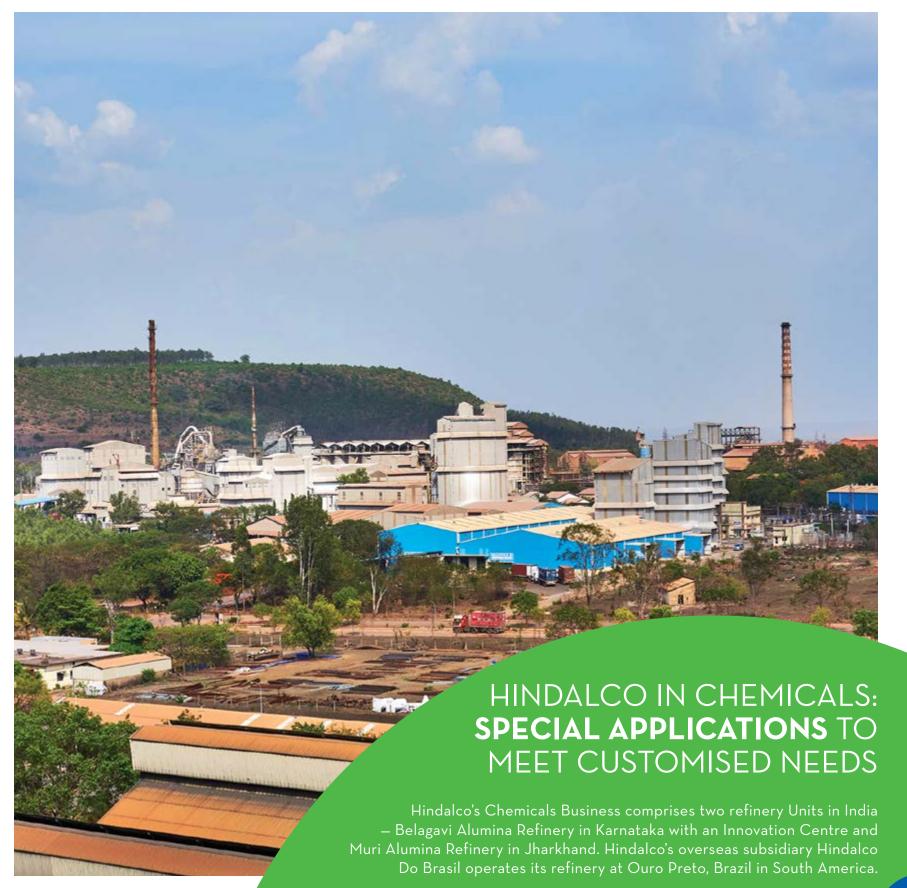
# PREMIUM PRODUCT FOCUS

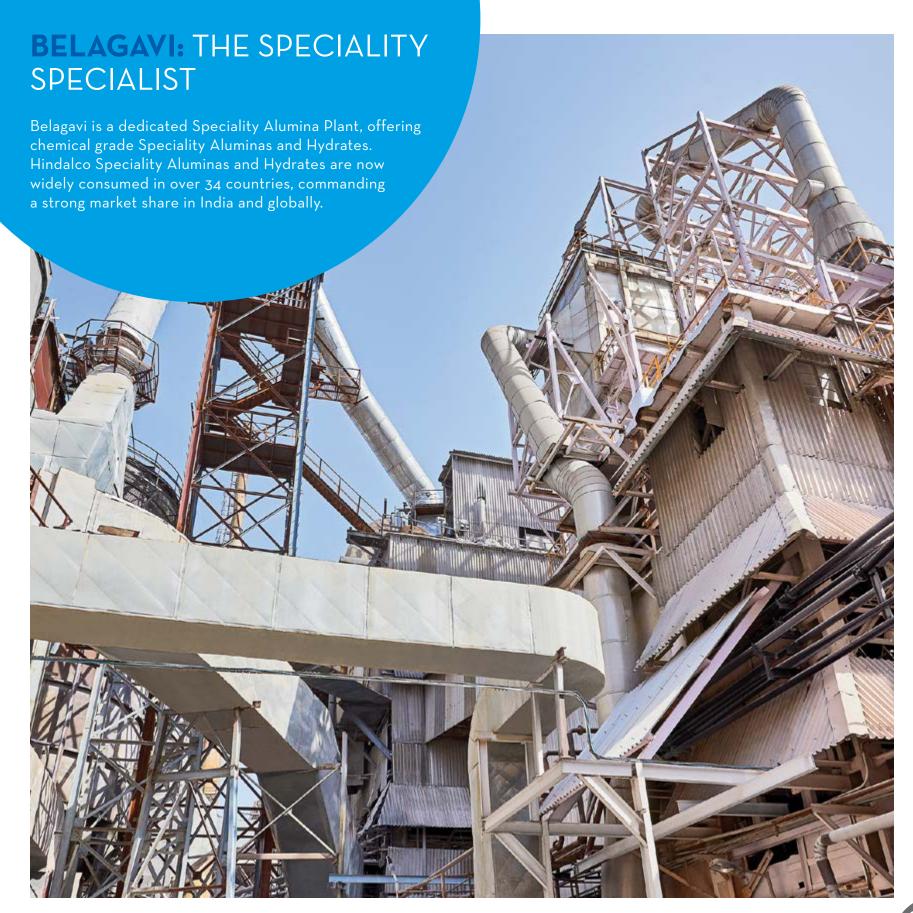
- Premium product segments (beverage can, automotive and specialities)
- Increased focus on high growth automotive segment



# HINDALCO IN SPECIALITY ALUMINA

From smart phone display screens to detergents and floor tiles; from car air bags to bullet proof vests — all have Speciality Aluminas produced by Hindalco







## A **GROWING RANGE** OF GRADES

In-house development and production of Speciality Alumina and Hydrate started in the early 1980s with just one grade at Belagavi. This has now grown over the years to more than 120 grades spread over 45 applications and selling in 34 countries.

One of the latest developments is addition of new product lines in Speciality Alumina, which has helped the business to enter into display glass applications for mobile phones and television sets — one of the fastest growing markets in the world.

A number of products are also at pilot stage of development, such as alumina for emission control ceramics, low soda fusion grade products, low soda alumina for vacuum circuit breaker, high purity alumina for different high tech ceramics, superfine precipitated alumina hydrate offering fire resistant solutions to different polymer applications like wire and cable, etc.



# **SPECIALITY PRODUCTS**

Hindalco's chemical products are used in numerous industrial formulations. What makes these products special (hence referred to as non-metallurgical grade or Speciality Aluminas & Hydrates), is that they impart benefits of scratch resistance, strength against abrasion and impact, chemical resistance, glossy look and shine to enhance quality of life; and as electrical resistance, fire retardants & smoke suppressants to ensure human health and safety.



## **PURE WATER FOR PEOPLE**

Hindalco Alumina Chemicals serve the needs of society in another important aspect, namely, supply of customised Alumina Hydrates that go into making of Alum and PAC used for water purification. It is estimated that about 8% of the urban population of India uses clean water that is purified using Hindalco products.

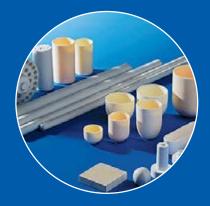


# MAJOR APPLICATIONS

- Display glass for mobile phones
- Refractories & Castables
- High Tension Insulators
- Floor Tiles
- Solar Panels
- Tableware Ceramic and Glass
- Glassware Cosmetic Bottles, Pharmaceutical Bottles, Injection Ampoules, Laboratory Equipment
- Detergent Bars
- Ceramic Insulators
- Electrical Switchboards

- Automotive Components
- Ceramic products used as grinding media
- Brake liners
- Catalytic Converters for emission control in cars
- Electric cables









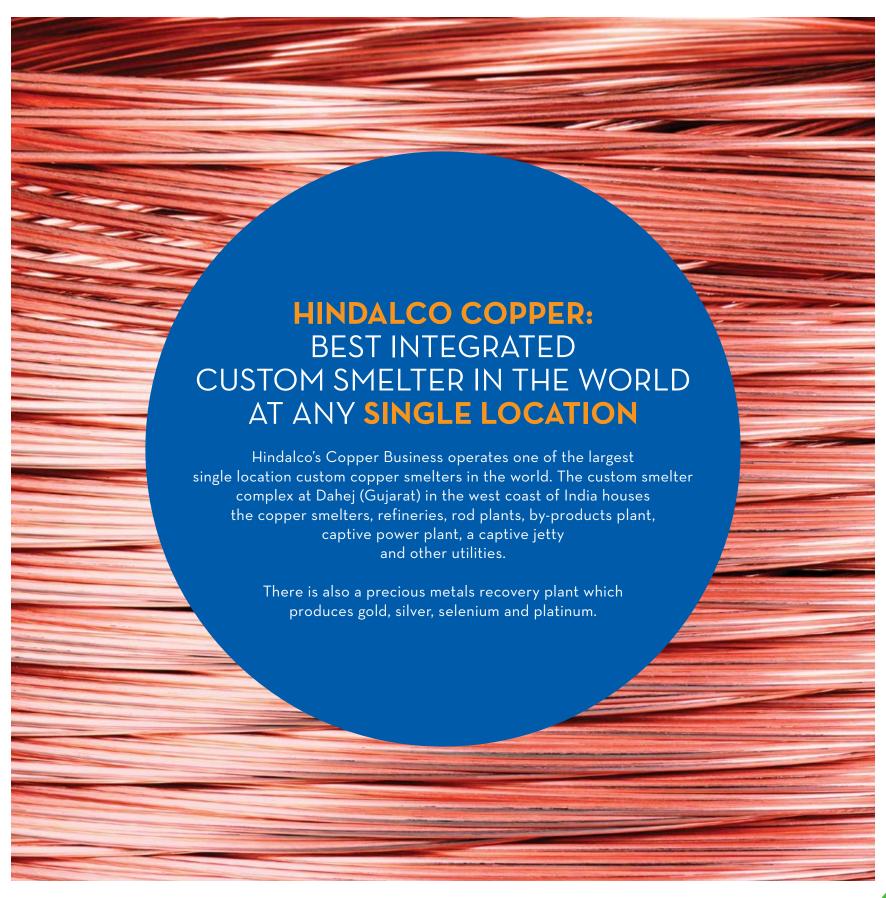












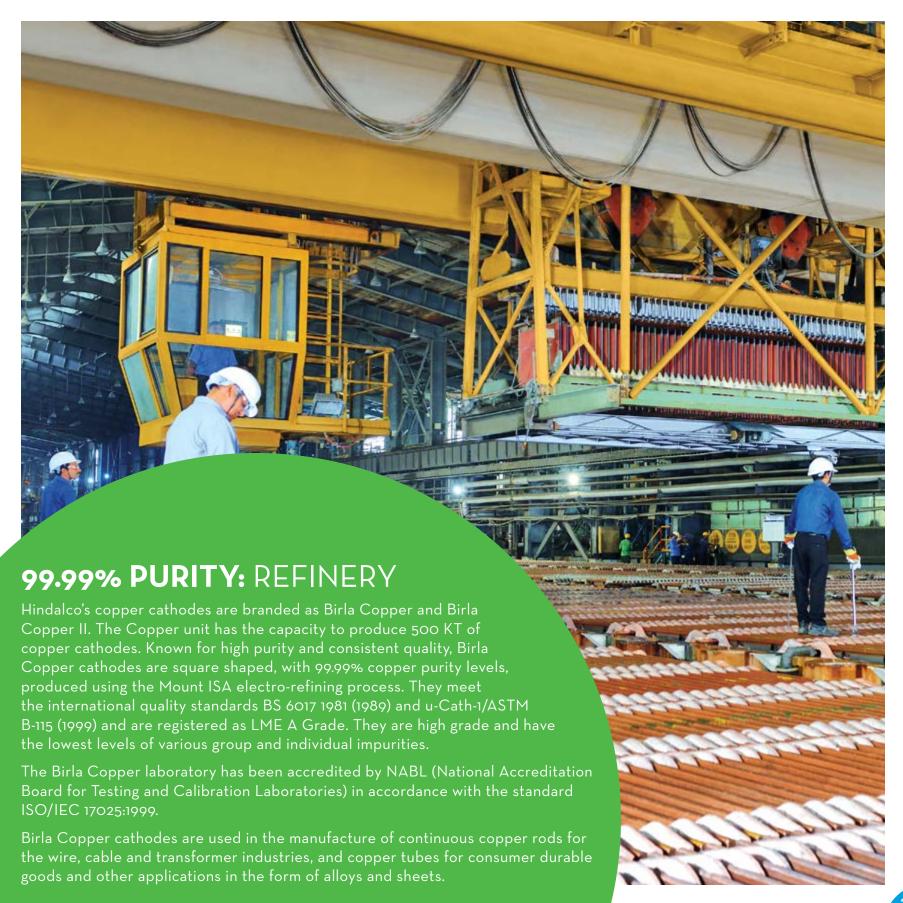


# Established in 1998

ISO 9001, 14001, 27001, 50001 & OHSAS 18001 certified Registered on the London Metal Exchange

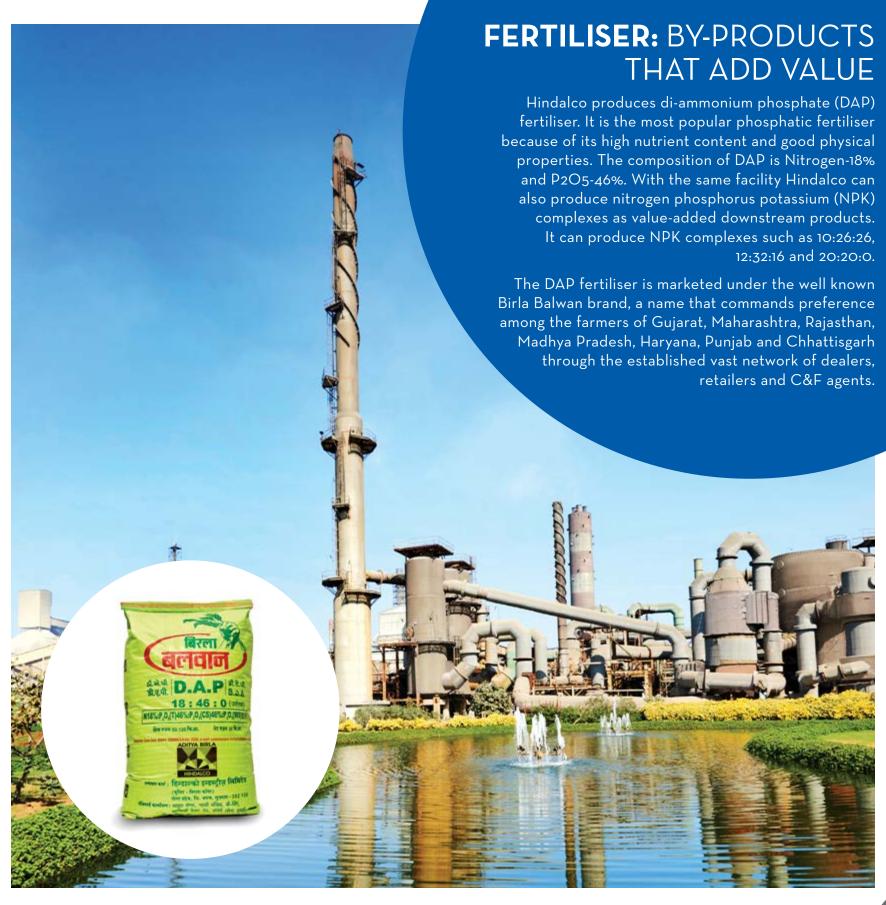
# **Capacities**

Refined Copper: 500 ktpa | Copper Rod: 400 ktpa Sulphuric Acid: 1670 ktpa | Phosphoric Acid: 210 ktpa DAP & Complexes: 400 ktpa | Gold: 15 tpa Silver: 150 tpa | Power: 135 MW









# SUSTAINABILITY FRAMEWORK

# **SUSTAINABILITY VISION**

The world is moving towards developing products which are environmentally and socially sustainable as well as utilisation of existing products in more renewable applications. Changing trends in sectors, such as automotive where there is growing demand for lighter metals to enhance fuel efficiency are further boosting the growth potential for aluminium.



## OPTIMISE **ENVIRONMENTAL** FOOTPRINT

Hindalco's focus is on leveraging operational excellence to optimise its environmental footprint. This signifies managing resources sustainably and responsibly, while at the same time improving performance on aspects like energy conservation, zero water discharge, waste minimisation and recycling, with very high priority on safety performance. Hindalco has aligned its efforts with the global call to mitigate climate change and has committed to do its bit to limit the global temperature rise to less than 2°C.



### RECYCLABILITY

The Company continues to strive towards developing applications and products which maximise recycling and minimise resource extraction in India, while Novelis maintains its position as the global leader in Flat Rolled Products. Drawing upon the unique nature of aluminium, a 100% recyclable metal which does not degrade in quality on recycling, Novelis has invested in major recycling initiatives and has been able to use 57% of its input in the form of recycled scrap.



# **GREEN** INITIATIVES

Mining: Greening/Sustainable Practices/Biodiversity | Refining: Pollution control/Value from waste and safe storage Smelting: Pollution Control | Power: Investing in renewable energy and alternative use for wastes Manufacturing: Zero Waste/Rainwater Harvesting/Zero Liquid Discharge

### UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

Hindalco's sustainability initiatives and strategies are aligned with the UN Sustainable Development Goals (SDGs). The Company's Sustainability Committee is chaired by its Managing Director. It reviews the sustainability performance at regular intervals. Areas of prime importance on which the Company is working on include:

# SUSTAINABILITY FOR **BUSINESS GROWTH**

Hindalco's approach to sustainability focuses on sustainable mining practices, energy conservation, recycling, environment-friendly disposal of industrial wastes, safety practices, socio-economic development of the communities around the plant and empowerment of employees. It sets clear policy and institutional framework, systematically monitors performance, encourages continuous improvements and innovative practices, and deepens the dialogue with all stakeholders.



### **ZERO LIQUID** DISCHARGE

Water Conservation and achieving 'Zero Liquid Discharge' status continue to be a strong focus area. Various initiatives have been undertaken across plants towards reduction of water consumption and efficient recycling of treated water. Over the past three years use of recycled water at the units has doubled.



#### **VALUE** FROM WASTE

Avoidance, Reduction and Reuse of waste created is systematically and efficiently handled through Hindalco's 'Value from Waste' initiative. Innovative ways are regularly explored to reduce, and reuse waste generated. For instance, a recently commissioned Red Mud Filtration (RMF) unit is helping in reducing the caustic soda content in the red mud.



#### THE 'WASH' PLEDGE

As a responsible organisation, Hindalco is working towards achieving the World Business Council for Sustainable Development's Water, Sanitation and Hygiene (WASH) pledge to ensure supply of safe drinking water, sanitation and hygiene in all its operations.



#### **ALTERNATIVE ENERGY**

Several initiatives have also been taken towards energy efficiency and reduction of GHG (greenhouse gas) emissions. Alternative sources of fuel and power such as biomass and solar power have been successfully commissioned. In recognition of its initiatives, the Ministry of Power has awarded the National Energy Conservation Award to many of Hindalco's manufacturing Units.



### RESEARCH & DEVELOPMENT: SUSTAINABLE FUTURE

A global presence brings with it a global responsibility. It is a responsibility towards customers to provide the best and most environment-friendly products. Hindalco and Novelis Innovation and Technology Centres along with research labs at all manufacturing units, work towards creating process efficiencies and innovative products.

Hindalco's Research and Development teams work to create pioneering solutions to the technology challenges faced today for all tomorrows. Better products and innovative manufacturing processes ensure product quality while safeguarding the environment. With over 200 employees dedicated to R&D including Global Technology Centres, Hindalco offers leading expertise in areas of applied technology, market-led innovation and technical services for customers.



#### RECOGNISED RESEARCH CENTRES

Research and Development at Hindalco in India is spearheaded by the three Hindalco Innovation Centres (HIC) at Belagavi, Taloja and Dahej. The Innovation Centres at Belagavi and Taloja are recognised by the Department of Scientific & Industrial Research (DSIR), Government of India. HIC Semi Fab Taloja is also ISO 9001:2015 certified and accredited in accordance with the standard ISO/IEC 17025:2005 by the National Accreditation Board for Testing and Calibration Laboratories (NABL). Developmental and analytical services over the years have earned the centres national and international recognition, including the National Award for R&D efforts.

Every day Novelis furthers its commitment to build upon its rich heritage of innovation to develop new products and processes to meet the growing needs of its customers. At its Global Research & Development Centres, which are strategically located around the world — including USA, Switzerland and South Korea — Novelis is able to maintain close proximity to its customer-base and work alongside them to develop the newest and most innovative aluminium solutions in the market.

Novelis' Global Technological Organisation offers new solutions for Hindalco and its customers.

#### HINDALCO INNOVATION CENTRE

Alumina - Belagavi, India | SemiFab - Taloja, India





#### NOVELIS GLOBAL RESEARCH & TECHNOLOGY **CENTRE/NETWORK**

Kennesaw - Georgia, USA | Spokane - WA USA | Gottingen - Germany | Sierre - Switzerland | Ulsan - South Korea







#### ADITYA BIRLA GROUP R&D SUPPORT

For conducting R&D in select areas of work, Hindalco engages the Aditya Birla Group's corporate research and development centre, Aditya Birla Science and Technology Company Private Limited (ABSTCPL).

ABSTCPL's forte of having multi-disciplinary teams of technical experts, scientists and engineers, enables developing competencies in select areas in order to provide long term value to the business.

### PLANT LEVEL TECHNICAL CELLS

Every manufacturing plant has its own R&D/technical cell that works on quality assurance, process improvements, and new product development. R&D teams at Unit levels have launched projects to achieve higher amperage, lower specific energy consumption and minimal interruptions of process flow.













#### PEOPLE AT THE CORE

Hindalco's long term success rests on its people who have high commitment levels and are working to meet the challenges of the future. The Company culture values performance that comes through empowerment, so that people don't feel they are working 'for' the organisation but 'with' the organisation. Well laid-out processes and management systems foster an environment of growth through collaboration, with a young and vibrant multi-cultural workforce. Learning and development are well integrated with business objectives to enhance functional and leadership capability. Competencies are aligned and developed through on-the-job learning, classroom programmes, coaching, mentoring and e-learning modules.



## **LEADERSHIP CULTURE**@ HINDALCO

Hindalco's robust talent management programme focuses on developing a leadership pipeline across levels. The aim is to attract and retain best talent through challenging and exciting opportunities across geographies and functions, to build leaders who in turn practice seamless teamwork and develop their teams.

#### **'ZERO HARM'** CULTURE

Hindalco is working towards a 'Zero Harm' culture. Safety underpins every decision and activity. Ensuring health and safety of not just employees but also contract workers, is of paramount importance. A Safety Board chaired by the Managing Director along with business heads and functional heads, reviews safety initiatives and closely monitors safety performances with unit teams.









Rajashree Birla

Chairperson

Aditya Birla Centre for Community Initiatives and Rural Development











#### A NATIONWIDE IMPACT

Investing part of the profits beyond business was a norm at Hindalco even before the government recognised its need and mandated it. Community projects are carried out under the aegis of the Aditya Birla Centre for Community Initiatives and Rural Development, led by Rajashree Birla. The Centre provides strategic direction and the thrust areas for work, also ensuring performance management.

All development activities fall under five key areas: Health Care, Education, Sustainable Livelihood, Infrastructure and espousing Social Causes.

The various initiatives span across the country impacting a population of around 1.2 million across 626 villages and 22 urban slums in the states of Odisha, Jharkhand, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, West Bengal, Gujarat, Maharashtra, Karnataka and Kerala.









#### **INCLUSIVE AND EQUITABLE EDUCATION**

Hindalco has been tirelessly working to provide access to quality education to the rural community, by setting up and supporting schools, running balwadis/adult literacy centres, providing scholarships and focusing on educating the girl child.

- · Hindalco's Aditya Birla Public schools offer quality education at remote locations
- · Coaching centres and ITI training to local youth offer additional vocational learning opportunities
- Strong financial and infrastructural support is given to revamp and improve the facilities at local schools, including teaching aids, computers, uniforms, stationery, classrooms, toilets, midday meals, etc
- Encouraging girl students through the Mahan Jyoti Scholarship for higher studies and supporting the Kasturba Gandhi Balika Vidyalayas
- Supporting Adult Literacy centres and encouraging computer literacy
- Other educational support programmes include setting up of a Mini Science Centre at Saraswati Shishu Mandir School near Mahan Aluminium; as also Knowledge Centre/Library at various other places









#### **HEALTH** CARE

Addressing the sorely lacking medical facilities in the remote areas around its plant sites has been the primary focus for Hindalco. Some major initiatives include:

- Rural medical and awareness camps, including surgical camps organised in remote areas
- Building good medical facilities, e.g. hospitals and Health/Dispensary Centres; new hospital set up at Utkal Alumina and at Mahan
- Mobile Health Camps in remote areas focus on TB, polio eradication, dental, cataract, skin diseases
- Ambulance services with modern well-equipped vans
- 8 Company run hospitals and 15 Dispensaries/Clinics that serve local communities
- Furthermore, Hindalco supports several Government initiatives like primary health centres









#### MOTHER AND CHILD CARE

Hindalco runs an extensive pre and post-natal care for mother and child health. Many of these projects are carried out in remote areas where traditionally such health care was rarely available.

- Polio immunisation camps as well as administering of BCG, DPT and anti-Hepatitis B vaccines
- Family welfare centres to care for expectant mothers as well as post-natal care
- Nutrition and escort services for institutional delivery
- · Adolescent health care with focus on girl child and menstrual health issues
- Motivational drive on awareness of Responsible Family life

#### SUSTAINABLE LIVELIHOOD

Helping communities to build their self-reliance has been the prime focus through income generation programmes, especially for those in project affected areas; build employability through vocational training, empower women and support farmers to improve their agricultural methods for higher crop yield. Hindalco has tied up with Xenteo to build sustainable mining models around the Gare Palma Coal mines eco-system.

#### Notable achievements include:

- Project Saksham at Utkal Alumina a garment production unit at Tikiri to help 30 women earn a livelihood
- Project Kaushalya at Utkal Alumina supports vocational training to women in tailoring, appliqué work at Nuagaon and then extended to Paikupakhal and D.Karol villages
- Project WADI has been started in collaboration with NABARD which will benefit 500 farm families across 15 villages
- Mahan Aluminium has constructed Check Dams for water management, facilitating agriculture in over 4,000 acres of land which has helped over 6,000 farmers. This process in the hilly terrain helps preserve rain water and does not cause displacement to communities nor does it destroy natural resources
- Farmers training helps to impart knowledge on crops, fertilisers, pest management, and thereby improve the agricultural output
- Additional sources of income through dairy, poultry, animal husbandry help supplement low income families. Aditya Aluminium has promoted Banaraja chicks rearing with over 6,000 birds given to 1,000 beneficiaries, out of which over 150 of them are earning more than ₹4,000 to ₹5,000 per month
- Empowering Women is an important key to Sustainable Livelihood. Skill development training has been implemented to motivate and build self-reliance. There are currently 1,571 Self Help Groups empowering 21,696 households and running successfully









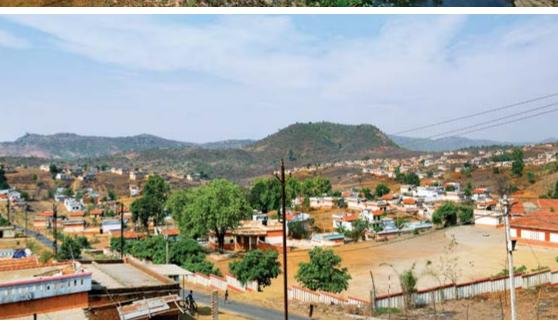
#### **INFRASTRUCTURE** DEVELOPMENT

Hindalco improves the infrastructure around its units through:

- · Constructing roads, community halls, temples, ponds, bathing ghats
- · Building irrigation and check dams
- Ensuring safe drinking water and clean drainage system in villages
- Supporting electrification drives while also promoting renewable energy sources such as solar street lights and solar operated drinking water supply and biogas units









#### **ESPOUSING SOCIAL CAUSES**

Hindalco believes in promoting socio-economic development of the communities while preserving the unique cultural ethnicity of each region.

- · Religious, cultural and sports events promote harmony and positive attitude
- Street plays and awareness drives are conducted on the evils of child marriage, dowry, domestic violence and to help support gender equality, promote widow remarriage and run de-addiction campaigns







#### **HINDALCO INDUSTRIES LIMITED**

#### **Corporate Office**

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#### **Registered Office**

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Andheri (East), Mumbai 400 093
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www.adityabirla.com | www.hindalco.com

#### **OFFICES**

#### Noida

Mindmill Corporate Towers 5th Floor, 24 A, Film City, Sector 16 A Noida (UP) 201 301, Ph: +91 120 669 2100

#### Bhubaneswar

Bengalur<u>u</u>

J-6 Jaydev Vihar Bhubaneswar 751 013, Ph: +91 674 236 0362

Ph: +91 80 4041 6000-4 (7th floor)

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Industry House, 45 Race Course Road, Bengaluru 560 001

Ph: +91 80 4041 6100-3 (2nd floor including Copper)

#### Kolkata

Jeevan Deep, 1st Floor 1, Prafulla Chandra Sen Sarani (Middleton Street) Kolkata 700 071, Ph: +91 33 2280 9710

> Industry House, 17th Floor, 10 Camac Street Kolkata 700 017, Ph: +91 33 2282 1630

#### Ranchi

Vasundhara Mega Mart, 2nd Floor Near Argora Chowk, P.S. Argora Ranchi 834 002, Ph: +91 651 224 7900

#### Vadodara

The Park, Unit 301-303, 3rd Floor Akshar Chowk, O.P. Road Vadodara 390 012, Ph: +91 265 233 8655

#### Novelis Inc.

3560 Lenox Road, Suite 2000 Atlanta, GA 30326 USA, Ph: +1 404 760 4000

## GROWING WORLDWIDE PRESENCE

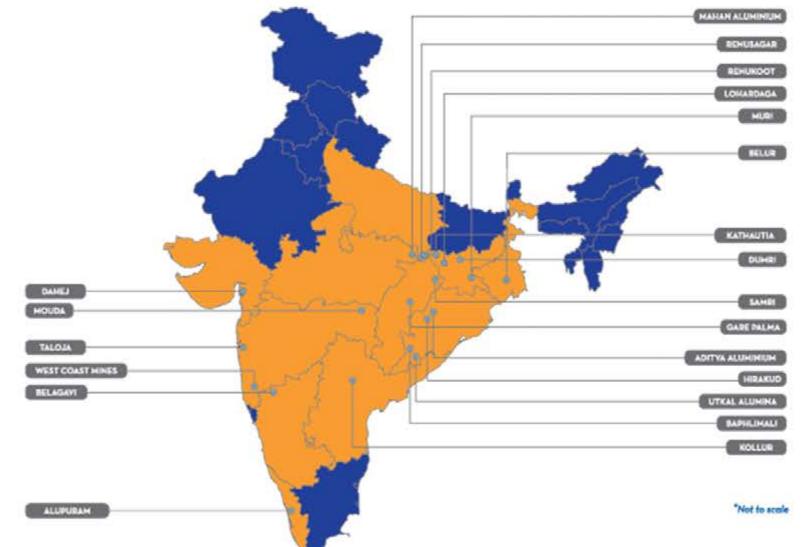


44 MANUFACTURING LOCATIONS

**CONTINENTS** 

COUNTRIES

Hindalco In India

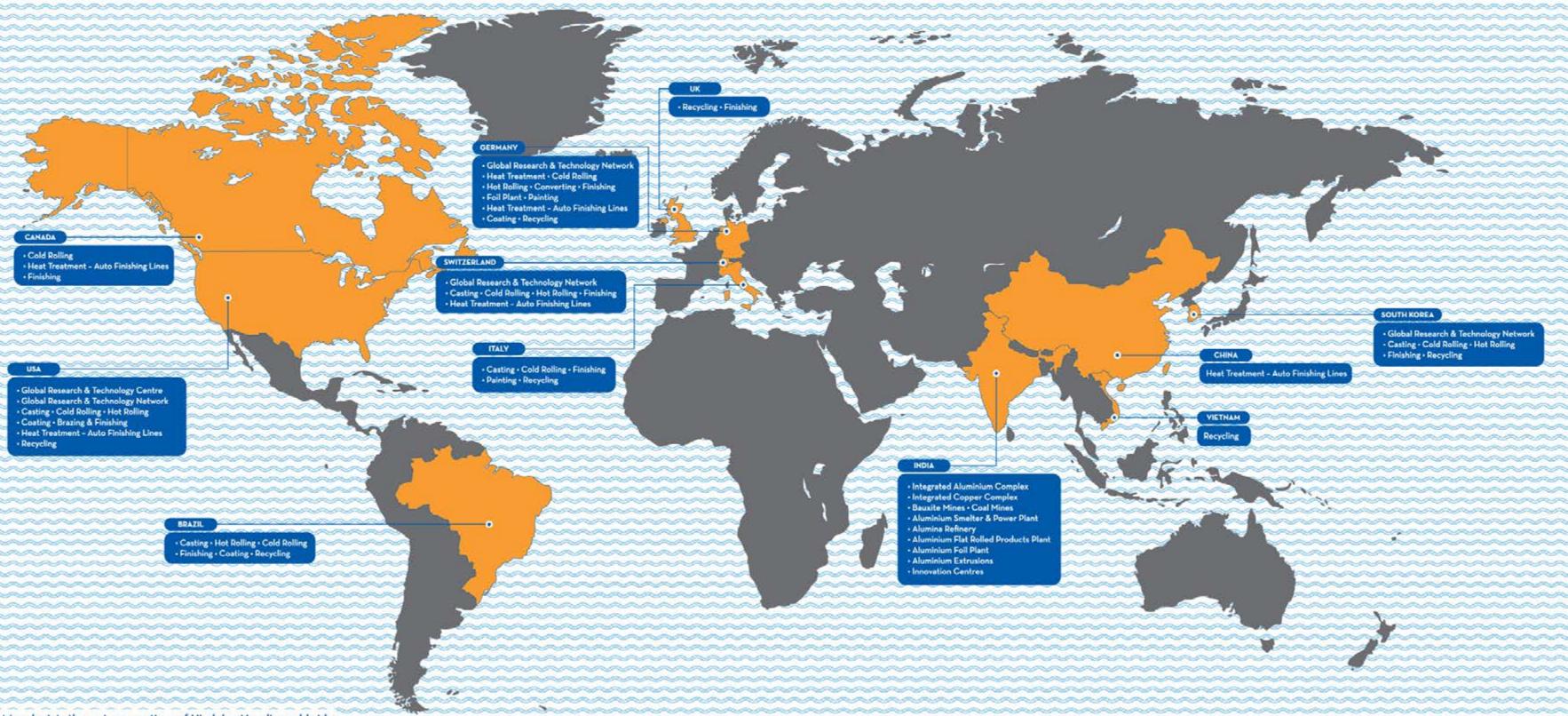


LOHARDAGA Bauxite Mines SAMRI Bauxite Mines BAPHLIMALI Bauxite Mines **WEST COAST MINES** Bauxite Mines GARE PALMA Coal Mines KATHAUTIA Coal Mines DUMRI Coal Mines RENUKOOT Integrated Aluminium Complex MURI Alumina Refinery UTKAL ALUMINA Alumina Refinery BELAGAVI Alumina Refinery | Innovation Centre MAHAN ALUMINIUM ADITYA ALUMINIUM HIRAKUD

RENUSAGAR TALOJA

BELUR MOUDA KOLLUR ALUPURAM DAHEJ Aluminium Smelter | Power Plant
Aluminium Smelter | Power Plant
Aluminium Smelter | Power Plant
Aluminium Flat Rolled Products Plant
Power Plant
Aluminium Flat Rolled Products Plant
Innovation Centre | Recycling
Aluminium Flat Rolled Products Plant
Aluminium Foil Plant
Aluminium Foil Plant
Aluminium Extrusions Plant

Integrated Copper Complex



Map depicts the major operations of Hindalco-Novelis worldwide \*Not to scale

# ACROSS THE METALS VALUE CHAIN



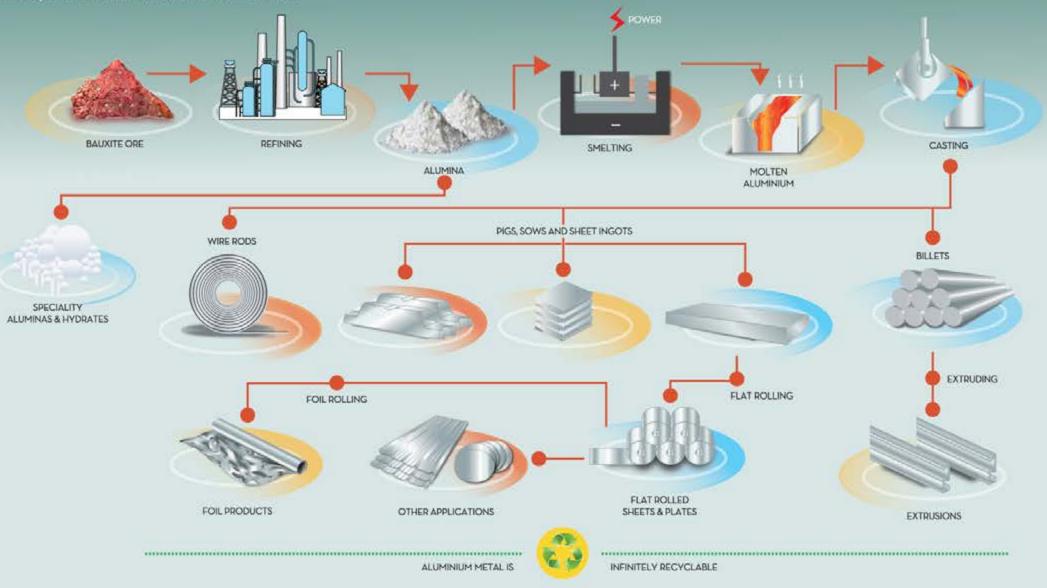
#### The Making of Aluminium

Aluminium is not found in free form in nature, even though it is the most common metal on earth. Bauxite is the only ore from which aluminium can be economically extracted. The aluminium production process can be broken down into three stages: first, bauxite is extracted from the earth, second, it is processed into alumina and then, using electrolytic reduction methods, alumina is converted

into molten aluminium. Alloying ingredients are added to change the chemical and mechanical properties of aluminium in line with market requirements (to increase strength, to make it denser or to change the heat transmission properties). Molten metal is then cast into various shapes and sizes and converted into value-added

products like sheets, foils, extrusions and wire rods, to produce a wide range of aluminium products for use in various industrial and consumer applications.

Speciality grade aluminas and hydrates are important non-metallurgical value additions for applications in products like refractories and ceramics.



# ACROSS THE METALS VALUE CHAIN



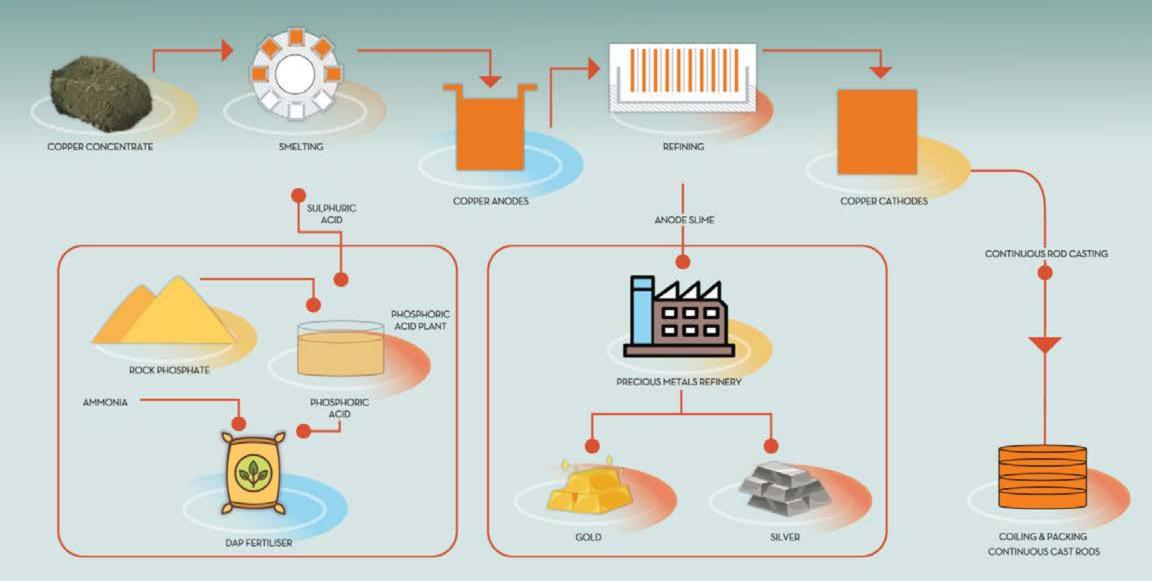
### The Making of Copper

Copper is one of the basic elements in the world. The ore, after mining, goes through a process of concentrating to remove waste and other material.

When fed into a smelter, the copper concentrate (27% Cu) make copper wires. Copper cathodes, rods and wires as undergoes several chemical reactions, transforming it into finished goods find application in electrical, electronic, molten metal called blister (98.5% Cu), which is refined into

anodes. Each copper anode (99.5% Cu) further undergoes the final electro-refining process to convert into pure copper cathodes (99.99% Cu). Copper cathodes are re-melted into continuous cast rods and further drawn to make copper wires. Copper cathodes, rods and wires as finished goods find application in electrical, electronic, automotive, construction, railways and other industries.

Sulphuric acid produced from sulphur dioxide rich off gas generated during smelting, is either used to produce DAP fertiliser or sold as merchant grade sulphuric acid. Gold, Silver, Selenium and other precious metals are also important by products which are recovered and sold.





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