Tata Group is one of the world’s fastest-growing and most reputable corporations

Tata Group

- Tata businesses span 7 major industry sectors
- India’s largest private sector employer, with 425,000 employees worldwide
- Operations in more than 80 countries
- Total revenue in 2010-11: $83.5 billion (up 24% on 2009-10)
- International revenues (from outside India) grew from $3.2 billion in 2003-04 to $48.3 billion in 2010-11 (= 58% of Group revenues)
- Tata ranked the world’s 41st most valuable brand in 2011 at $15.75 billion (Brand Finance)
- Rated the world’s 11th most reputable company in 2009 (Reputation Institute)
Tata Steel is one of Tata’s largest companies

Largest companies

- Tata Steel
- Tata Motors
- Tata Consultancy Services
- Tata Power
- Tata Chemicals
- Tata Global Beverages
- Tata Communications
- Indian Hotels
Tata Steel Group is Fortune 500 company

- 2007: Tata Steel acquired Corus
- 2010: Corus rebranded to Tata Steel

Tata Steel Group:
- Annual crude steel capacity of **26.7 million tonnes**
- Around **80,000 employees**
- Manufacturing operations in **26 countries across 5 continents**
- Present in both mature to emerging markets
- Serving customers all across the globe
- Turnover 2010-11: **$26.6 billion**
  (2009-10: $22.9 billion)
Tata Steel is present in both mature and developing markets worldwide

Tata Steel Group

- Tata Steel Europe
- Tata Steel Thailand
- NatSteel Asia
- Tata Steel India

UK & Ireland
- 3 steelmaking facilities
- 11mtpa crude steel capacity
- 16 manufacturing locations
- 33 distribution centres

USA
- 3 manufacturing locations
- 2 distribution centres

Other EU
- 19 manufacturing locations
- 13 distribution centres

Netherlands
- 1 steelmaking facility
- 6.9mtpa crude steel capacity
- 6 manufacturing locations
- 6 distribution centres
Tata Steel in Europe: 2nd largest steel producer with an advanced product range

- High quality, complete product range of steel products and related services
- Manufacturing sites in the UK, the Netherlands, Germany, France and Belgium
- 17.9mtpa crude steel capacity
- Supplying to all demanding steel markets
- Sales offices and service centres in close to 50 countries
- Approximately 33,500 employees
Key markets we serve

- Automotive
- Construction
- Energy & Power
- Lifting & Excavating
- Packaging
- Rail
- Aerospace
- Consumer Goods
- Defence & Security
Tata Steel in Europe
One integrated, customer-driven company

Our customers and markets

Sales and Marketing (sector teams/customer services)
- Automotive
- Construction
- Lifting & Excavating
- Packaging
- Energy & Power
- Rail
- Industry Strip & Long

Supply chain

Operations hubs
- Strip MLE
- Strip UK
- Long EU
Our steelmaking plants benefit from their coastal location

Tata Steel in Europe

- All our plants benefit from their close proximity to the coast
- **Strip Products Mainland Europe**: largest steelmaking facility located in IJmuiden
- **Strip Products UK**: largest steelmaking facility located in Port Talbot
- **Long Products Europe**: largest steelmaking facility located in Scunthorpe
- **Downstream processing and service capabilities** close to our customers
Our steel enables a sustainable future

Durability, efficiency and flexibility make steel the material of choice for the world’s most sustainable buildings.

Steel remains the essential ingredient for sustainable vehicles and new grades make them even more efficient.

Steel not only supports the future of energy generation, but new steels make the generators themselves more efficient.
Tata Steel in Europe – making products society needs in the most responsible way possible

### Producing steel products for the future
- Advanced steels – high-strength, formable, durable – tailored to enhance environmental, social and cost impact
- Industry-leading advice on use of steel

### Investing in sustainable steel-making
- Leading partner in European programme Ultra-low CO₂ steelmaking
- HISARNA pilot plant at Ijmuiden to save 20% CO₂ emissions

### Improving our existing processes
- Focus on energy, waste, CO₂, emissions, safety
- Major investment, e.g. Port Talbot BOS gas recovery saves 300 kt CO₂ per year

### Facilitating the recycling loop
- Tata Steel Packaging Recycling is the largest steel recycler in the UK
- Education and initiatives in UK and the Netherlands to encourage recycling
Climate change is one of the most pressing issues the world faces today.

In response to this challenge, **Tata Steel Group will be part of the solution** and will achieve a leading position within the steel industry whilst creating value through:

1. continuing **to improve its current processes**, improving energy efficiency & reducing emissions

2. investing in breakthrough technologies

3. developing **new products and services** to reduce environmental impact over the product lifecycle, offsetting emissions in manufacture

4. actively **engaging its workforce**

5. further developing its **pro-active role in global steel sector initiatives.**
The Blast Furnace route is approaching Best Practice but this accounts for 85% of the CO2 produced by the steel-making process.

Source: Thyssen-Krupp, Germany
A groundbreaking €59m part EU funded multi-phased R&D project, advanced by 48 European companies and institutes, to identify and develop breakthrough technologies that could enable a significant (~50%) reduction in CO₂ emissions from ore-based steel production by 2050. Includes CCS.

**Phase II: TGR Demonstration at Arcelor-Mittal Florange plant**
- Capex 400 M€+, NER300 bid

**Phase II: HISARNA**
- Further pilot plant trials then decision on progression to demonstration.
HISARNA

Benefits:

- 20% less CO$_2$/ts, 80% with CCS, lower raw material costs, reduced capex

Direct use of coal and ore
No coking and agglomeration
Hlsarna
Technological potential

- **Benefits**
  - Lower CapEx and OpEx
  - 20% reduction of CO₂/t HRC
  - Well suited for CO₂ storage (no CO₂ scrubbing stage needed)
  - 80% reduction with CO₂ storage
  - Substantial reduction of other emissions
  - Use of biomass possible
  - Increased flexibility raw material usage
Other Breakthrough Technology Developments

1. **Pegasus**
   - A phased approach to fast track, large scale CCS
   - Partners: SEQ, Siemens, CES, Tata Steel, Maersk
   - Main activities:
     - Use of low calorific gases
     - Zero emission power plant
     - CO₂ capture, transport & storage
   - Phase 1: 13MWe pilot plant
   - Phase 2: 400MWe power plant
   - Phase 3: Industrial implementation
Other Breakthrough Technology Developments

2. Conventional Water Gas Shift
   - A step-change CO₂ reduction solution based on gas processing techniques already implemented within the oil, gas and power industries
   - Feasibility study, partnering with Progressive Energy and 75% funded by the Technology Strategy Board
   - Pilot plant design developed
     - 85% CO₂ capture efficiency
     - 12% more energy efficient than use of amines.

3. Sorption Enhanced Water Gas Shift
   - ‘CAESAR’ laboratory project
   - ECN, Air Products, Politechnico di Milano
   - Pilot plant design being developed
Multiple (configuration dependent) Sources of CO₂

A Model Steel Plant

- Steel Plant
- Blast Furnaces: 2.0 Mt CO₂
- Stoves: 0.6 Mt CO₂
- Coke Ovens: 0.02 Mt CO₂ + coke breeze
- Sinter: 0.2 Mt CO₂
- Pellet: 1.4 Mt CO₂
- Power Plant 1: 6.2 Mt CO₂ (1000 MWth)
- Power Plant 2: 0.2 Mt CO₂ (250 MWth)
- Mills: 0.2 Mt CO₂

CO₂ emissions and energy sources are indicated by colored lines:
- Red: BFG
- Green: COG
- Blue: OG
- Pink: Mix
Transport & Storage

• Not the focus of our R&D programme
• But we clearly need to understand what can/cannot be transported and stored (specification)
• Believe that clustering is the only realistic way to minimise costs
From this Workshop?

- New perspectives on industrial CCS
- Holistic thinking, i.e. how can CCS integrate technically, cost-effectively, and sustainably with the I&S-making process
- Clarity on what can be undertaken in conjunction with other sectors and what requires industry specific R&D programme(s)
- Prioritisation of research areas
- To become part of a wider industrial CCS network
Thank you