TATA STEEL

TATA

Responding to the Climate Change Challenge

Green Steel Strategies, Brussels

5th April 2011

Dr Paul Brooks
Group Director, Environment

Presentation

1. Tata Steel
2. Tata Steel Climate Change Vision & Strategy
   - Short to Medium Term Efficiency Improvements
   - Effective Advocacy
   - Longer Term Breakthrough Technology Developments
   - Product & Market Developments
   - Employee Engagement
   - Working with worldsteel
3. Conclusions

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Tata Group

Indian conglomerate founded by JN Tata

- **>140 years history**

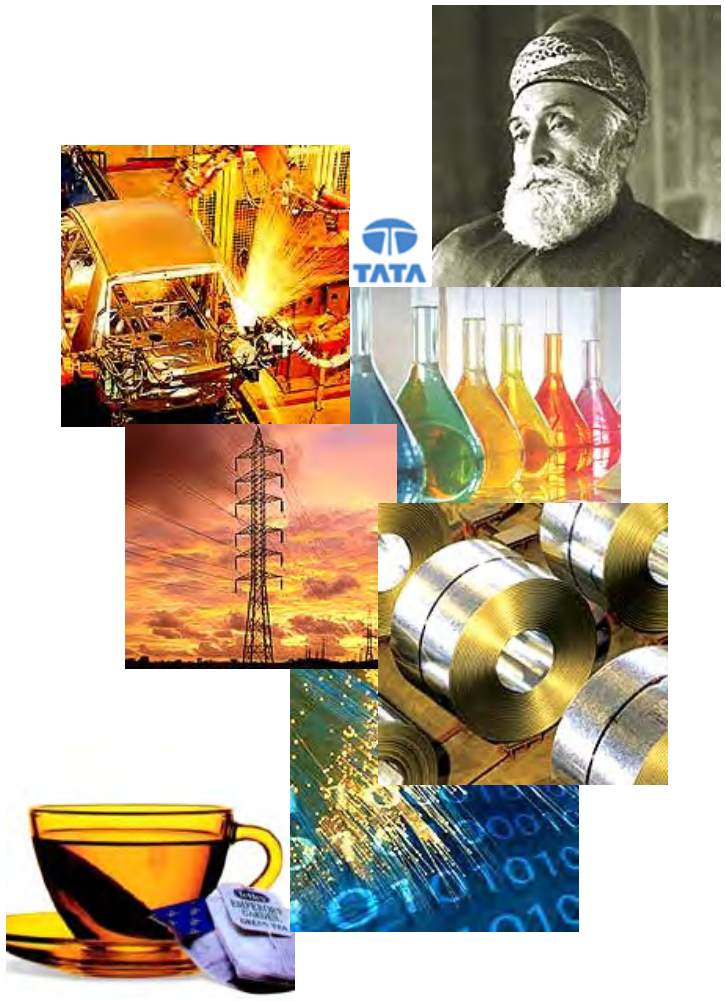
Strong social responsibility ethic

Combined turnover of ~$50bn

Presence in a number of business sectors

- **Materials**
- **Engineering**
- **Energy/power**
- **Transport**
- **Consumer goods**
- **Chemicals**
- **Communication & information systems**
- **Services**

~ 290,000 employees across 54 countries



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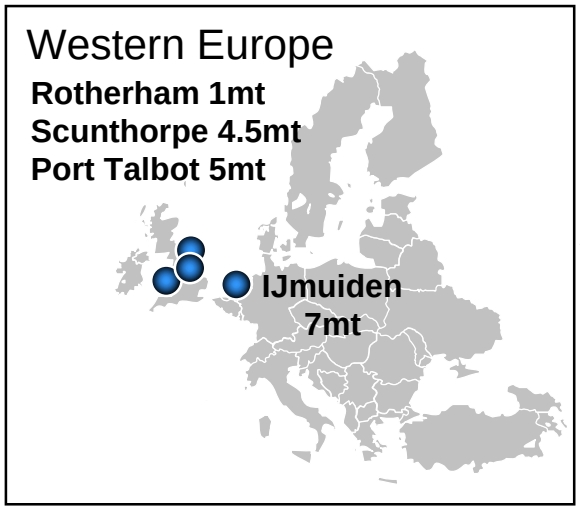
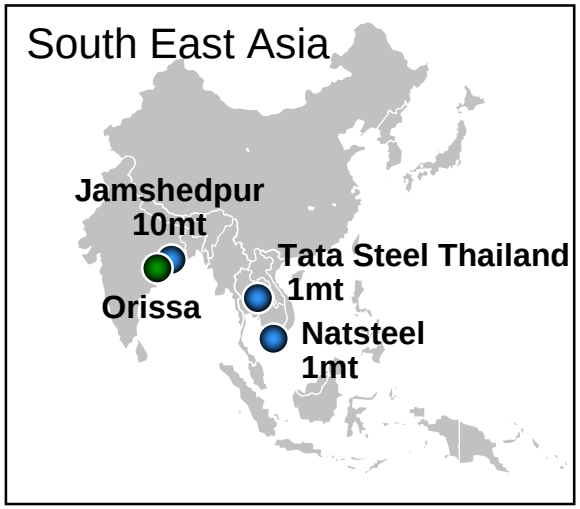
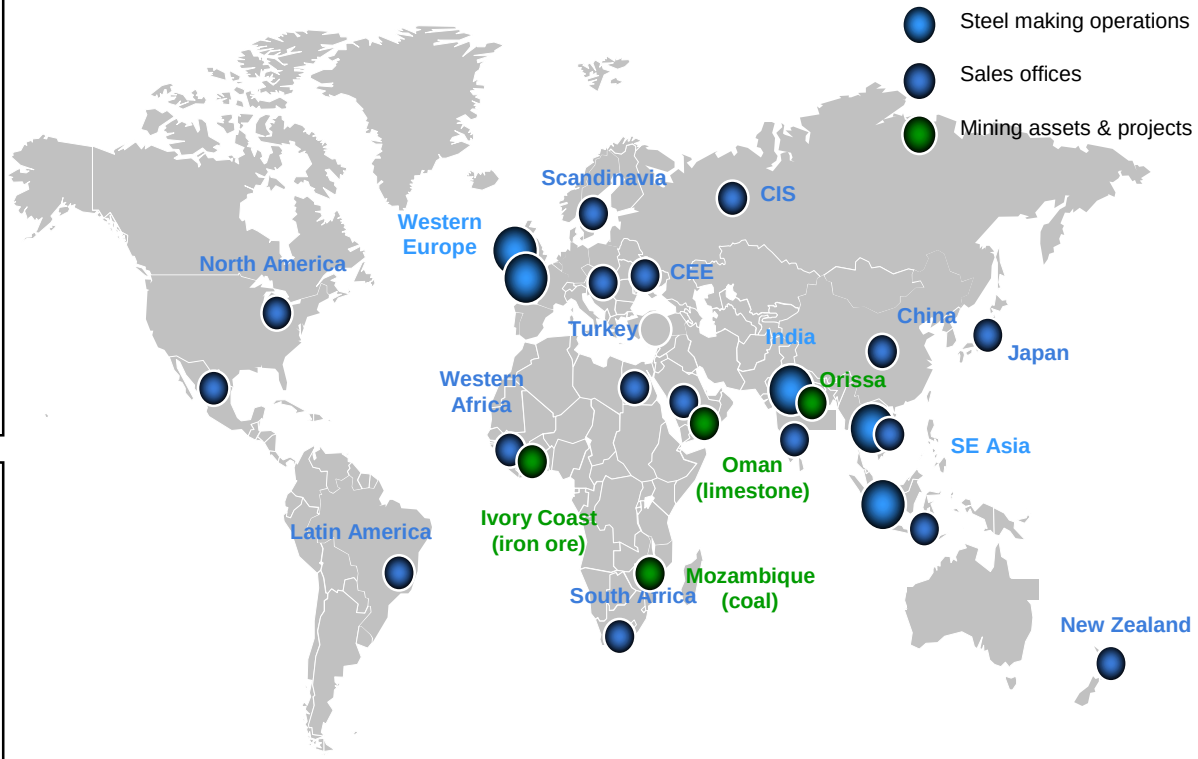
Global reach

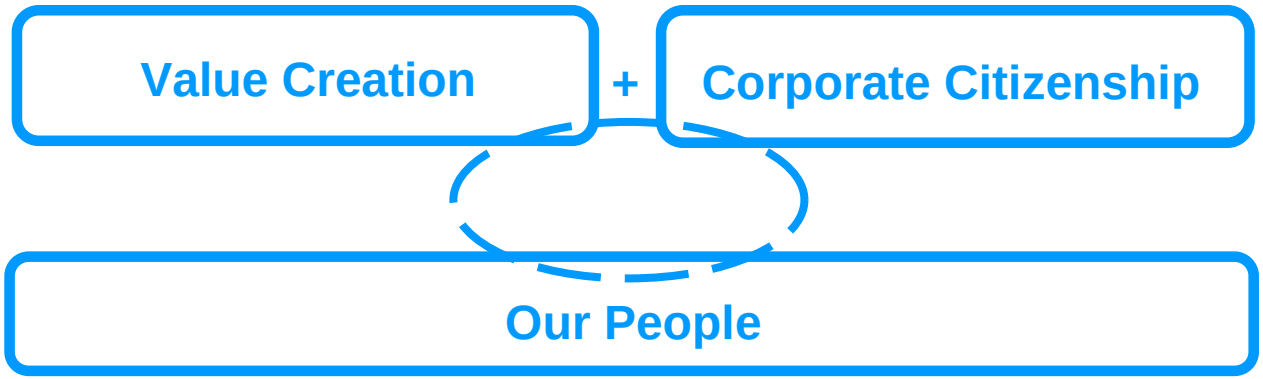






Our Vision

The Tata Steel vision is to be the world steel industry benchmark for value creation and corporate citizenship



- The vision translates into a number of ambitious five year goals which are measurable and tangible
- A performance culture supports the vision and goals.

Fit for the Future

New products

Rails for record-breaking high speed TGV trains

Polymer coated steel for new can concepts

Ultra high performance steels for Airbus

Steel plate for the pioneering Talisman Beatrice wind farm off east coast of Scotland

MagiZinc – award-winning coating with 4 times corrosion protection

Ympress S700 – strongest in the Ympress range of high strength, low-alloy steels

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Steelmaking & Climate Change
The challenge

Growth

World steel consumption will double by 2050

Sustainability

Ambition to cut CO_2 emissions by at least 50 % by 2050

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Climate Change Vision

Climate change is one of the most pressing issues the world faces today.

In response to this challenge, **Tata Steel 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**, reducing emissions to **<1.9 t CO_2/t steel by 2015 and to <1.7 t CO_2/t steel by 2020***

(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**.

* Under review, but equivalent to a reduction of at least 20% compared to 1990, worldsteel scope

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Short to Medium Term
Efficiency Improvements

- Burden management/productivity
  - Reduce fuel rate, use higher grade ores/coals
  - Consider using pellet rather than sinter (usually driven by production needs/process economics)
- Minimise iron consumption per tonne of finished product
  - Increase the scrap ratio (usually driven by process configuration/production volume needs)
  - Maximise yield, especially in downstream processes
- Housekeeping
  - Implement lower cost actions to improve energy efficiency e.g. better process control, high efficiency lighting and motors, variable speed drives, hot connect
- CapEx projects
  - Move towards energy self sufficiency
  - High efficiency power stations are important & are a pre-requisite to many other CO_2 saving schemes
  - Also includes
    - Process gas and waste heat recovery recovery projects, e.g. BOS gas collection
    - Production volume enhancements, e.g. PCI and new oxygen capacity
    - Other new plant, e.g. BF top gas recovery turbines.

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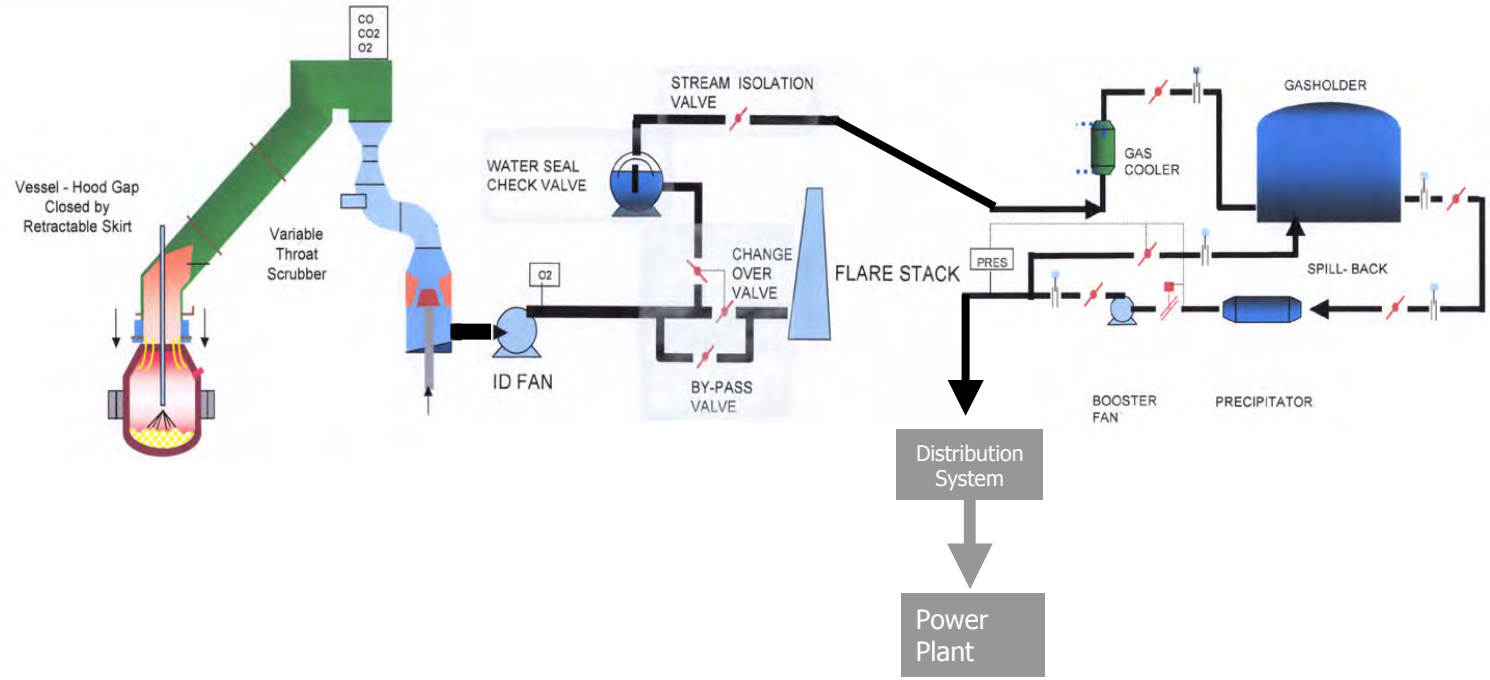
Example
BOS Gas Recovery at Port Talbot

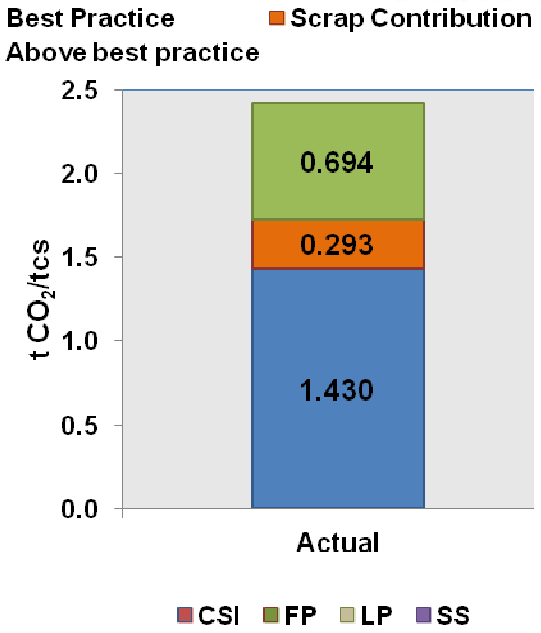


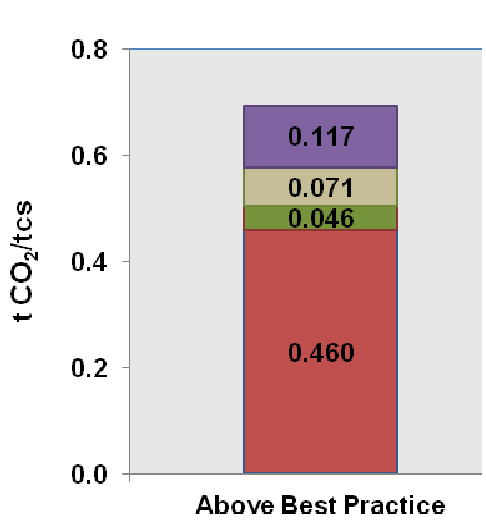
BOS Plant Gas Recovery at Port Talbot (an investment of ~£60m)

- Increases on-site generation from 61MW to 76MW; reduces electricity & natural gas imports
- Reduces CO_2 emissions by 240,000 t/year; reduces particulate emissions by ~40 t/year.

Mapping & Benchmarking
MoniCA

- A software tool developed internally
- Analyses the CO_2 emission & energy performance of all installations
- Deployed at all integrated sites and at other sites in Europe and the USA
- Jamshedpur benchmarked in 2010 and CO_2 emissions & energy will be monitored using MoniCA from April 2011





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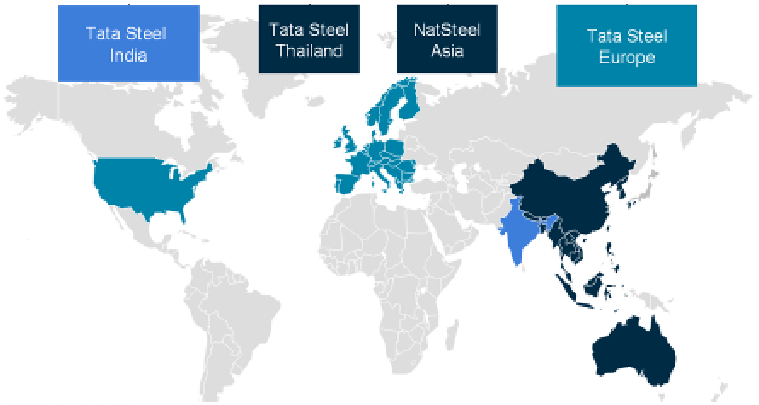
Supporting Implementation
Climate Change Task Team

Main areas of work:

- Development of CO_2/energy reduction plans
  - Integrated, EAF & downstream facilities
  - Energy audits
- Energy strategy, policy & standards
- Promotion, awareness & training
  - Intranet site, workshops etc
- Energy Optimisation Platforms (EOPs)
  - Energy efficiency sharing & learning events

A global network of
energy efficiency practitioners



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Effective Advocacy

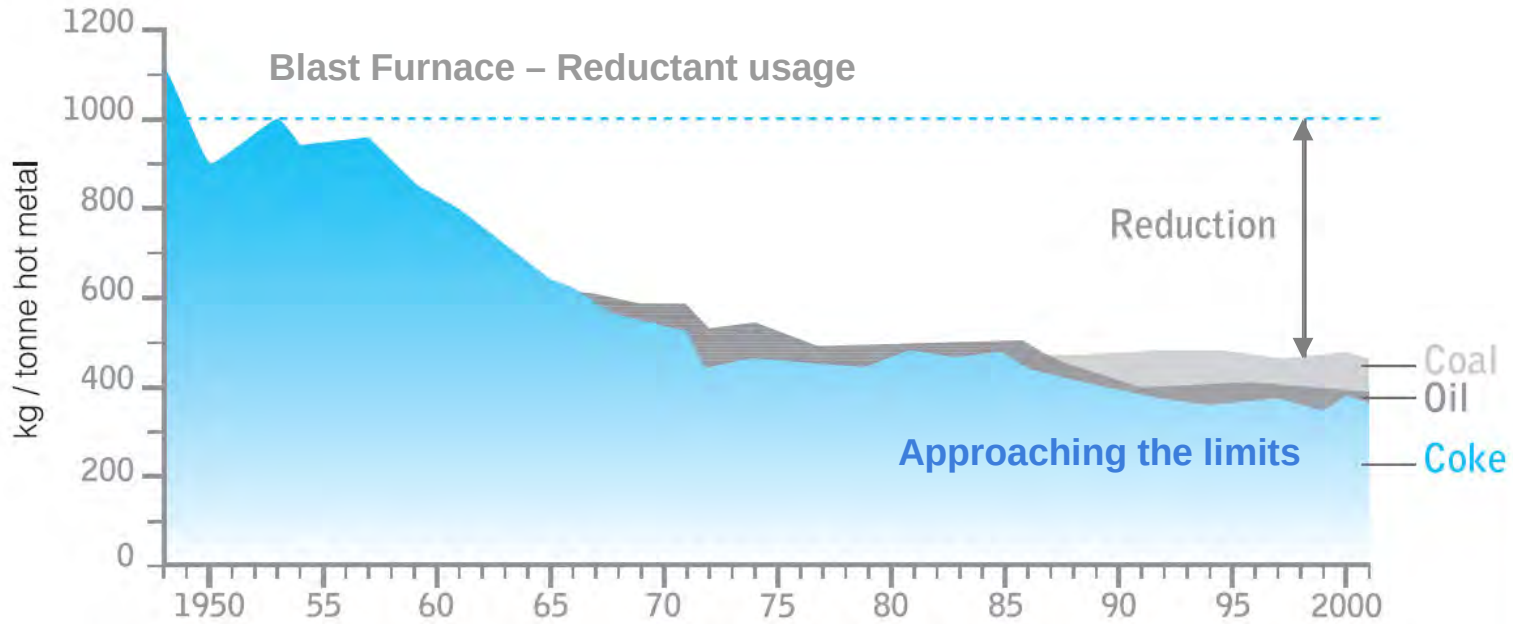
- EU ETS Phase 3 constitutes a major risk for the EU steel industry
- Current estimates suggest a shortfall even for best performers of ~7%
- New entrant reserve rules were improved at the last minute but the package could still act as a bar to future investment
- We want to ensure:
  - that we have a level playing field versus our non-EU competitors
  - that the longer term future of the EU steel industry is not jeopardised.

Steelmaking & Climate Change

Need for breakthrough developments:

- Focus on ironmaking (80 – 90 % of CO_2)
- Present operation close to “best practice”

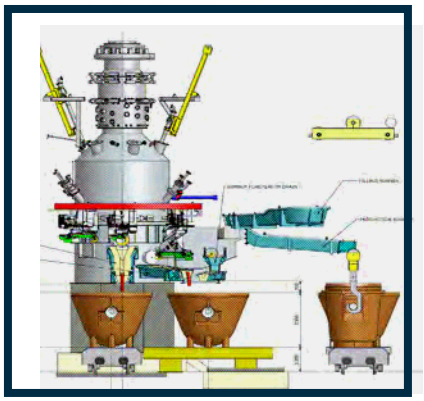
→ Further energy saving will not deliver long term target
→ Breakthrough development needed

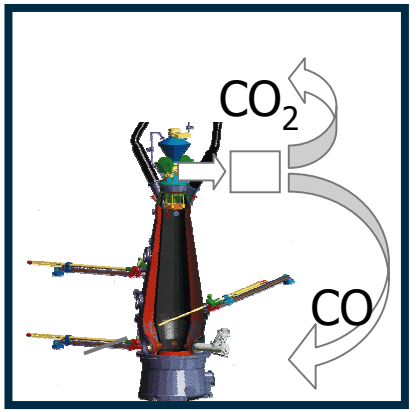


Breakthrough Technology Developments

- Research & development is continuing in order to try to find solutions to reduce CO_2 emissions through the development of breakthrough technology, e.g. ULCOS
- Through participation in ULCOS, several programs are underway to find less CO_2 intensive processes
  - Carbon capture & storage
  - New steel making technologies e.g. the HIsarna smelting reduction pilot plant at IJmuiden and ArcelorMittal top gas recycling BF demonstration plant at Florange

ulcos





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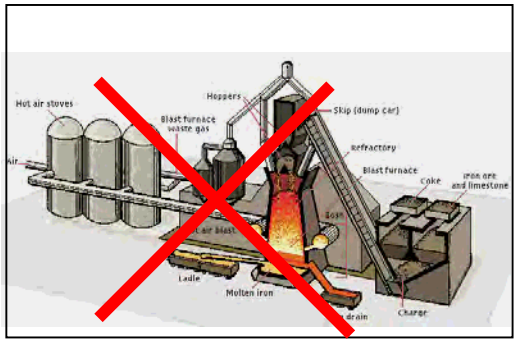
HISARNA Technology

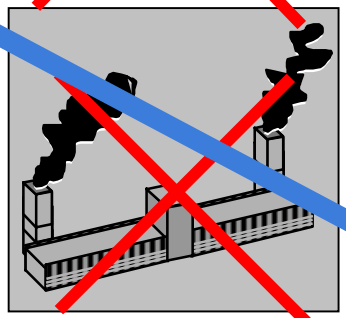
Comparison with the BF route:

Iron ore

sinter

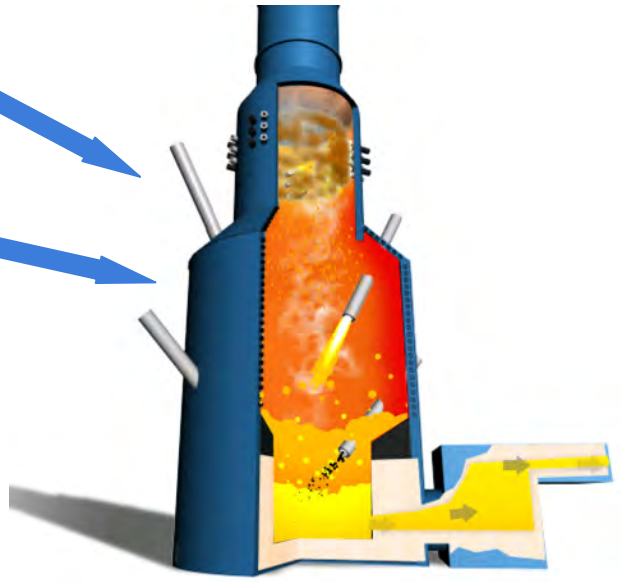
Blast furnace





coke

coal



Liquid iron

Direct use of coal and ore

No coking and agglomeration

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Pilot Plant at Tata Steel IJmuiden

- The HISARNA pilot plant was designed by the ULCOS partners in close cooperation with HIsmelt
- The plant was constructed by Tata Steel IJmuiden in-house engineering and project department
- The plant will be operated by:
  - Tata
  - ULCOS
  - HIsmelt.

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Strategic Studies: CO_2 Utilisation (Algae)

- Products: Bio-diesel, bio-mass, animal feed, etc
- To date:
  - Partnering with University of Sheffield (micro-bubble technology), using $2m^3$ pilot reactor using off-gas from Scunthorpe on-site power station
- Next:
  - Scale-up to multiple $8m^3$ reactor units, artificial lighting, algae processing, etc.
  - 5 year plan to deliver demonstration plant
  - Co-operation within Tata Group.

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Product & Market Developments

Tata Steel is continuing to develop products and solutions that will help our customers and their customers to reduce their carbon footprint

Automotive

- High strength steels/advanced high strength steels
- Low friction engineering steels for gearboxes/engines

Construction

- Light-framed steel housing
- Carbon neutral cladding, roofing & housing, sustainable construction, flood defences

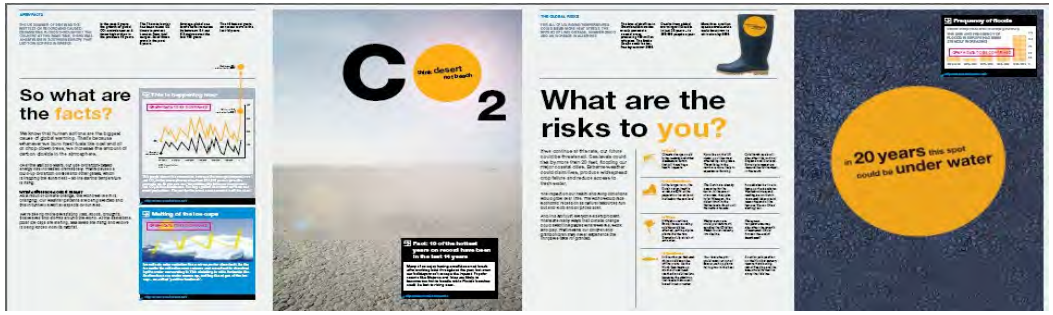
Power

- Offshore/onshore wind turbines
- Photovoltaic coatings, which have the potential, based on the surface area of coated steel cladding sold, to generate significant quantities of electricity
- High strength & special steels for nuclear power generation.

Employee Engagement
Local implementation

To date:

- Presentation pack provided for cascade
- CEO video available for general release, with subtitles, on-line & as DVD
- Focussed on “Small Actions, Big Results” campaign
- Further work to be done by business units on implementation.



Ongoing:

Regional/local campaigns, possible cascade to local schools.

A long term campaign, not a one off

Working With worldsteel
Climate change action plan

Reporting and targeting
- Common reporting methodology
- Third party endorsement
- Regional emission reduction targets

Technology
- Technology transfer / Asia-Pacific Partnership
- Breakthrough programme / ULCOS project

Off-setting with steel solutions
- Automotive
- Construction
- Energy

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Conclusions

- Steel is a (significant) part of the solution to climate change – if something is not made of steel, it is made with steel!
- Short to medium carbon footprint improvements are possible but are limited with current technology
- Breakthrough technology developments are needed for the medium to long term, but solutions need to be found for funding of demonstration plant and new generation technology
- There are commercial opportunities in relation to climate change, but we need a level playing field in terms of regulation versus our non-EU competitors such that the longer term future of the EU steel industry is not jeopardised and we can, in fact, be part of the solution.

Thank you for your attention!

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