



# “CARBON TRADING OPPORTUNITY AT HOOCHLY METCOKE AND POWER COMPANY LIMITED”

Seminar on “ENERGY CONSERVATION AND CARBON TRADING”  
organized by Indian Chemical Council  
on 3rd – 4th November 2006 at Centrum, World Trade Center, Mumbai



## Green house gas (GHG)

## Global Warming Potential (GWP)

- |  |               |
|--|---------------|
| ➤ Carbon-di-oxide (CO <sub>2</sub> )       | ➤ 1           |
| ➤ Methane (CH <sub>4</sub> )               | ➤ 21          |
| ➤ Nitrous oxide (N <sub>2</sub> O)         | ➤ 310         |
| ➤ Per fluoro carbons (PFCs)                | ➤ Upto 9,500  |
| ➤ Hydro fluoro carbons (HFCs)              | ➤ Upto 11,700 |
| ➤ Sulphur hexa fluoride (SF <sub>6</sub> ) | ➤ 23,900      |

➤ Human activities are increasing the **concentration of Green House Gases** ('GHGs') in the atmosphere.

➤ This enhances the green house effect, commonly known as **"Climate Change"**





- Increased energy efficiency, greater reliance on renewable energy sources, and the use of cleaner technologies together bring enormous economic, social, and environmental benefits that can lead a country on a much-desired road to sustainable development.
- Using tradeable rights as means of pollution control was first suggested in 1968 by the Canadian economist, John Dale.
- After several emissions trading programmes implemented in the US, in December 1997, at the third conference of the United Nations Framework for Climate Control in Kyoto, governments the world over, agreed to a 5.2 per cent reduction in emissions of greenhouse gases by the developed countries from the levels existing in 1990 by 2008-12.



# Kyoto Protocol and CDM



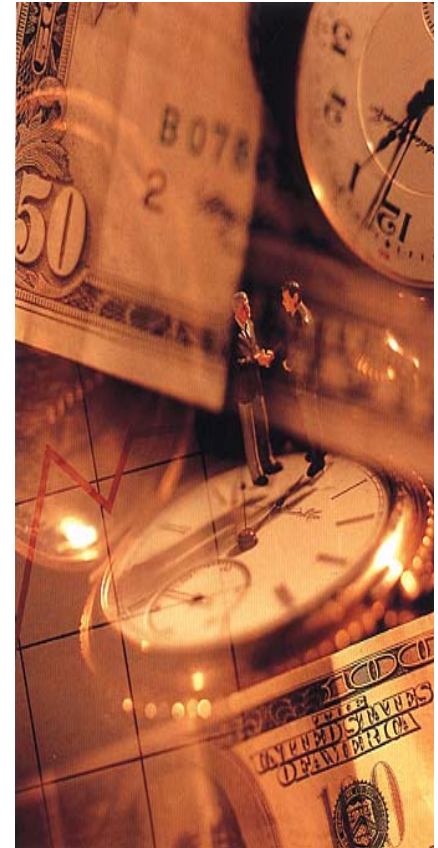
- Legally binding emission reduction targets for GHGs only for Annex-1 (i.e., developed ) countries
- Aim of reducing overall GHG emissions by at least 5.2% below 1990 levels in 2008-2012 commitment period

**Kyoto protocol** - Establishes **three mechanisms** to supplement national actions to achieve real, long term, measurable and cost effective GHG reductions:

**Clean Development Mechanism**

**International Emission Trading ('IET')**

**Joint Implementation ('JI')**



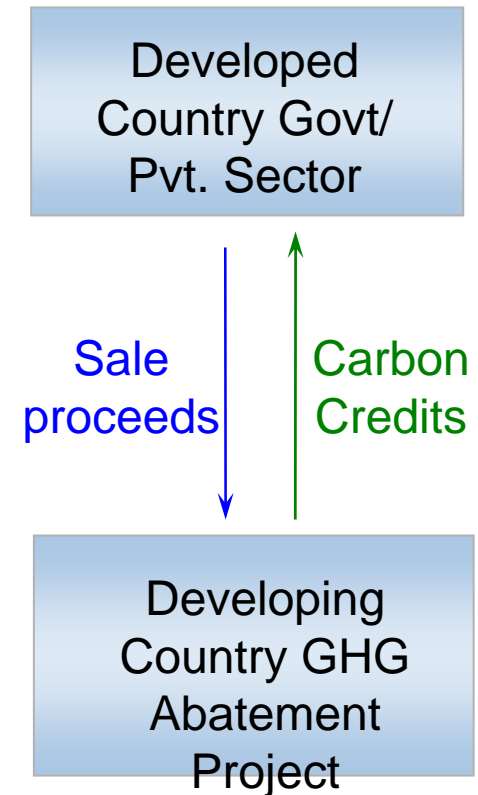
- Carbon credits are measured in terms of **Certified Emission Reduction** ('CER')
- One CER equals 1 MT CO<sub>2</sub> equivalent



➤ Developed countries listed in Annex 1 of the United Nations Framework Convention on Climate Change (UNFCCC) can invest in greenhouse gas (GHG) emission reduction projects in non-Annex 1 developing countries and

➤ Can claim the resulting Certified Emission Reductions (CERs) to assist them in compliance with their binding GHG emission reduction commitments under the Protocol.

Aim is to maximize the cost-effectiveness of climate change mitigation by allowing parties to pursue those opportunities to cut emissions, or alternatively, enhance carbon sinks, by investing in developing countries where Marginal Cost of Abatement of GHGs is lower



# Carbon funds are available through...



- International tenders for CDM projects
- Voluntary corporate initiatives
- Multilateral Funds
- EU commitment for carbon purchase through various schemes
- Bilateral negotiations with the consortium of buyers

## Carbon Price

- It's a market-driven price
- Approx prevailing price: Euro 10-15 / t of CO<sub>2</sub>-eqv



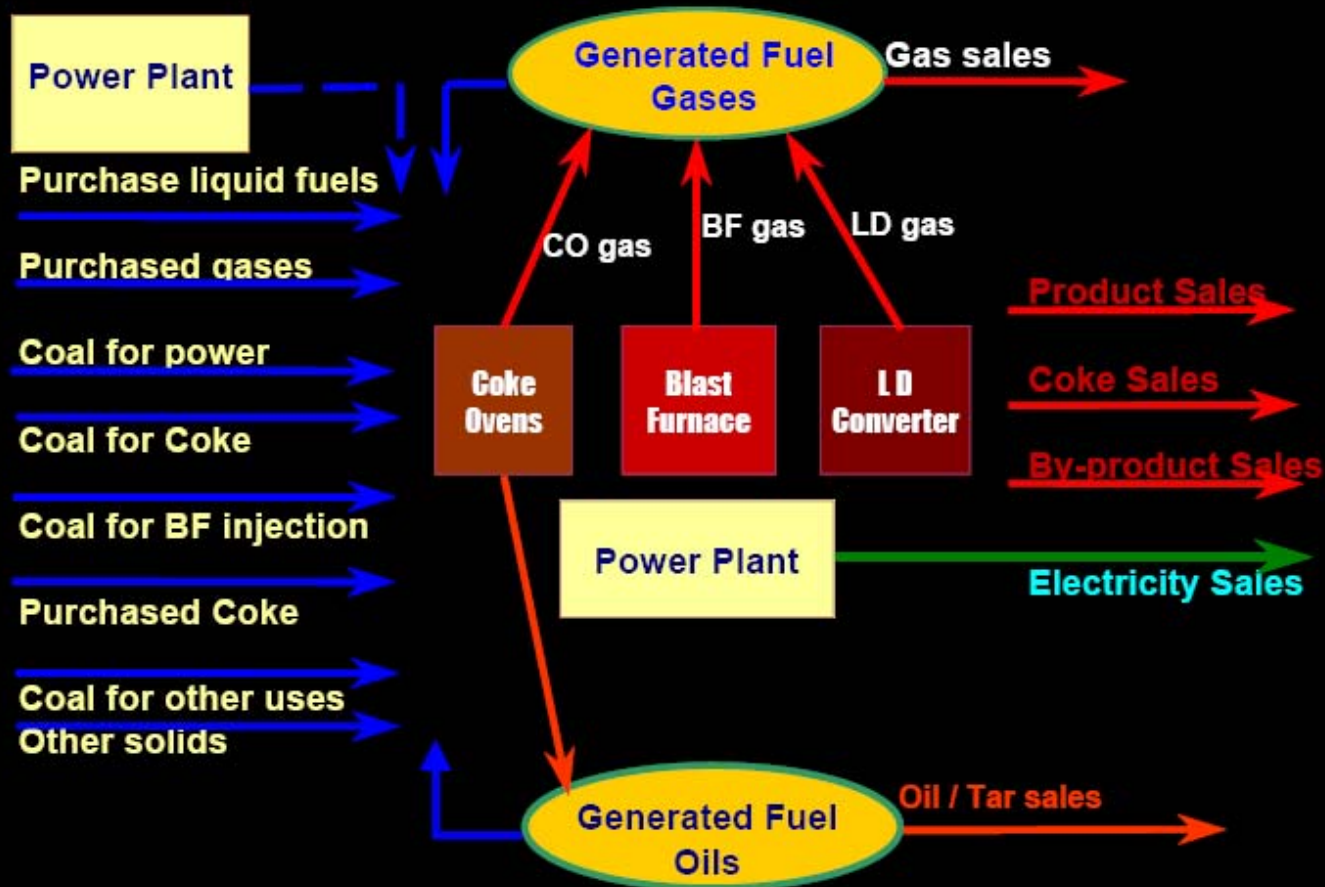


- India is the sixth largest producer of greenhouse gases, contributing almost 3 per cent of the world's total emission
- India is seen as one of the most attractive destinations for CDM-linked investments (after China).
- Core of the industrial sector in India consists of the energy intensive steel, cement, chemical and petrochemical sectors, the automotive sector and the pulp and paper industry.
- Iron and Steel sector is the largest energy consuming sector in the world, devouring 15% of world industrial energy
- Iron and Steel sector is of particular interest in the context of both local and global environmental discussions.





## Carbon flow sources in Integrated Steel Plant





- In India, specific energy consumption in steel making is in the range of 6.2 – 8.2 GCal/TCS (vis-à-vis international value – 4- 4.5 GCal/TCS)
- CO<sub>2</sub> emission is in the range of 2.2 – 3.2 T/TCS in India (vis-à-vis international value of 1.5 – 1.7 T/TCS)
- CO<sub>2</sub> emissions in steelmaking stem from the intense consumption of fossil fuels – for thermal energy, coke making, process requirement and electrical energy mainly.
- Carbon dioxide emissions from steel production, which range between 5 and 15% of total country emissions in key developing countries will continue to grow as these countries develop to cater to global steel demand
- Reducing energy intensity is therefore not only beneficial in saving scarce resources but also in reducing carbon emissions and thus mitigating global climate change.





- ▶ With increasing energy prices, diminishing reserves of conventional forms of energy, and increasing GHG emissions, it is a need of the hour for the iron and steel industries of the developing world to take a sustainability approach for utilization of the limited fossil fuel reserves of the earth.
- ▶ GHG emission reduction in iron and steel manufacturing facilities can be done through different routes like replacement / switching of CO<sub>2</sub> intensive fuel (e.g. oil to gas, coal to gas), energy efficiency in the process technology, waste processing, waste heat recovery projects including power generation, energy savings by elimination of reheating processes.
- ▶ Such technological initiatives for curbing GHG emissions, requires substantial capital investment, because of which India, with its mixed bag of plant and machinery (power + industrial) in terms of old, outdated industrial and power generation equipment coexisting with the latest, most modern machinery, is widely seen as a key CER supplier under CDM





- Tata Steel, India's largest private sector steel company, has taken Climate Change initiatives towards improving its energy performance through fuel substitutes, modernization, recovery & reuse of by-product energy.
- In integrated steelmaking, a major source of energy and CO<sub>2</sub> emissions is from the manufacturing of coke consumed in the blast furnaces.
- With continuous inflation in global steel demand and supply, there will be a necessity for increasing amount of coke production
- Hooghly Met Coke & Power Company Limited (HMCPCL), a joint venture company between Tata Steel and West Bengal Industrial Development Corporation (WBIDC) was formed on 10th Feb 2005 to produce 1.6 million tonnes per annum (mtpa)





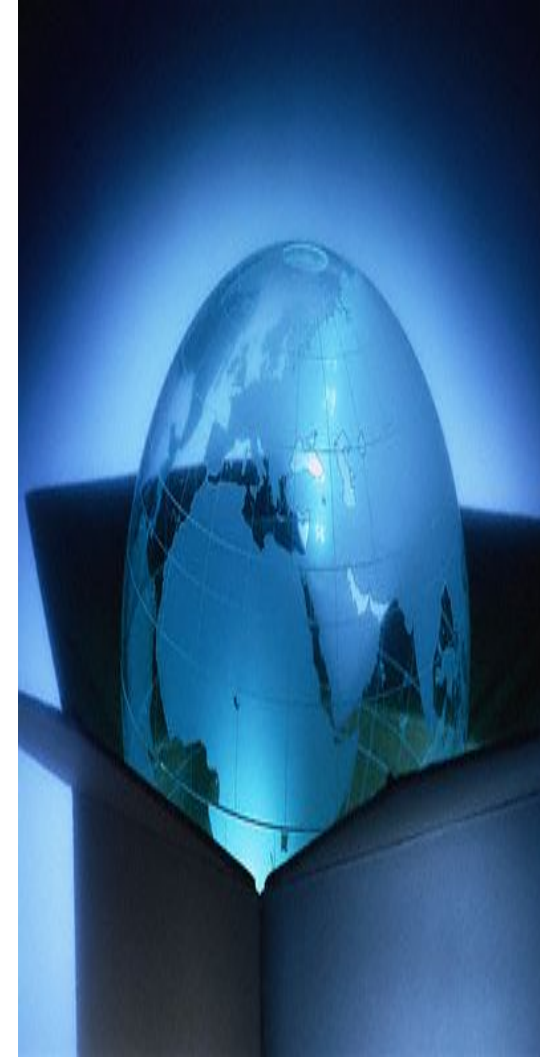
- ▶ HMCPCL is setting up a merchant Coke Oven plant of 1.6 MTPA capacity at Haldia Industrial Area in West Bengal, India.
- ▶ The proposed coke plant of HMCPCL will adopt the non-recovery type coke making process where the volatiles evolved during coal carbonization will be combusted completely in presence of controlled quantity of air.
- ▶ The heat of the evolving gases will be utilized for coking the coal mass into coke and thus no external heating will be required.
- ▶ Complete combustion of volatile matters in the coke ovens will result in generation of 60,000Nm<sup>3</sup>/hr of hot flue gases at a temperature of around 950°C.
- ▶ In line with the Tata Steel's endeavor to contribute to mitigation of global warming, HMCPCL proposes to facilitate the utilization of the sensible heat content of the waste gas emanating from the coke oven blocks, in generation of electricity.



# CDM Revenue through use of 'hot gases' for power generation



- ▶ The electricity generated will cater to the in-house demand of the coke oven plant of HMCPCL and the surplus power will be exported to the West Bengal State Electricity Board (WBSEB) grid.
- ▶ The power exported to WBSEB grid will displace equivalent quantum of electricity in the grid thereby contributing to the equivalent amount of GHG emission reduction at the thermal power stations connected to the grid.
- ▶ The estimated returns from the coke oven plant and from sale of coke oven gas, were found not to be commensurate with the huge capital investment that HMCPCL has to make for the coke oven plant.
- ▶ It was at that juncture that HMCPCL came across the flexibility mechanism of Clean Development Mechanism (CDM).
- ▶ The concept of CDM and its associated benefits percolated from the endeavors of Tata Steel
- ▶ HMCPCL decided to venture into possibility of earning additional revenues through CDM that may improve their operating margin





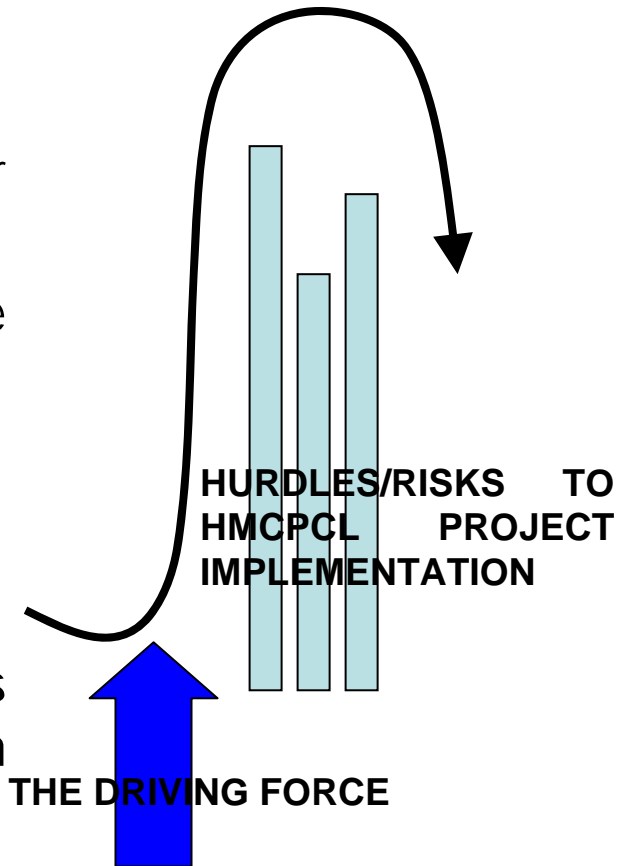
HMCPCL's decision for implementation of the project activity was further backed by the success of similar other projects in India as CDM cases

- ✓ 75 MW waste heat recovery based power plant of Jindal Steel and Power Company Limited having a non-recovery based coke oven plant at Raigarh – **Registered with UNFCCC**
- ✓ Utilization of coke oven flue gases from the Coke Oven Plant of Sesa Goa Limited and the excess blast furnace gas not utilized in the process of pig iron manufacturing, from the pig iron plant in the proposed power plant that will be set up by Goa Energy Private Limited on a Build, Own and Operate (BOO) basis – **Web-hosted with a request for registration to UNFCCC**



- Identification of other potential CDM projects.
- New concepts.
- Identification of applicable approval methodology or development of new methodology.
- Various stages and documentation prior to registration before UN.
- Helping in validation of project.
- Identification of prospective buyers of CER.

After comparing profile and credentials of various consultants HMCPCL chose **Ernst & Young** to assist them in the CDM process cycle.



POTENTIAL OF GETTING CDM REVENUES

# Availing the CDM benefits



- ▶ GHG emission reduction potential of HMCPCL project is approximately 60 lac tonnes of CO<sub>2</sub> equivalent in 10 years
- ▶ HMCPCL is looking at CDM revenue of around **60% of their capital investment** in the project activity, which is acting as the main driving force for implementation of the same inspite of the un-favourable assured financial returns
- ▶ CDM projects are not just a way to receive CERs, they provide an opportunity to pursue a sustainable business model that offers a range of leading-edge competencies such as new relationships, new forms of collaborations, and new business processes used in the development of new markets and products.



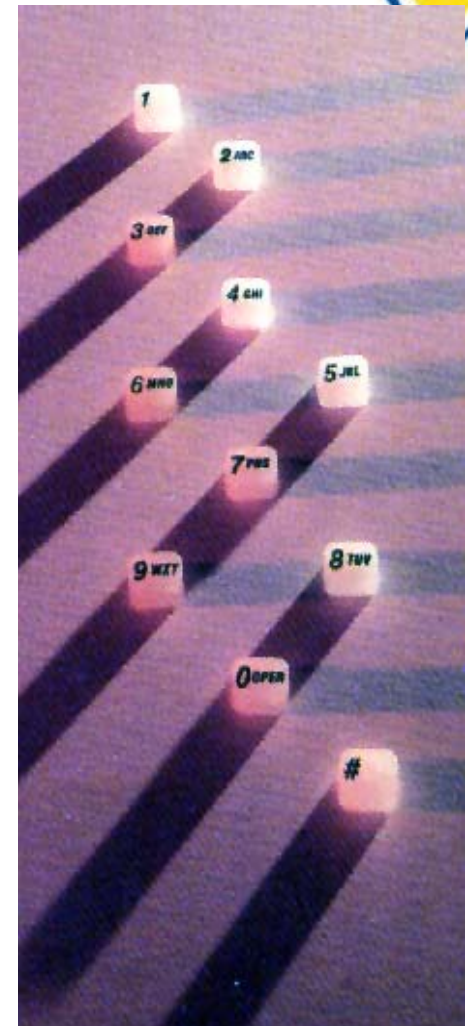


## MAJOR MILESTONES achieved by HMCPCL in the CDM cycle

1. Preparation of Project Concept Note
2. Preparation of Project Design Document
3. Host Country Approval (applied)

## MI LESTONES yet to be achieved

4. Selection of validation agency (underway)
5. Project Validation
6. Project Registration





# Thank You

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