THE HUMAN TOUCH OF CHEMISTRY

WELCOME TO THE 69th ANNUAL GENERAL MEETING
4th August, 2008
III. Financial Overview

v. ‘The Human Touch of Chemistry’
I. FINANCIAL OVERVIEW
Note: FY2006 Consolidated financials include BMGL’s Q4 results and IMACID’s performance over 11 months

* Post consolidation
Profit After Tax – Excl. Exceptional Items

CAGR 23 %

<table>
<thead>
<tr>
<th>Year</th>
<th>in Rs. crore</th>
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<tbody>
<tr>
<td>FY03</td>
<td>197</td>
</tr>
<tr>
<td>FY04</td>
<td>221</td>
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<tr>
<td>FY05</td>
<td>341</td>
</tr>
<tr>
<td>FY06</td>
<td>353</td>
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<tr>
<td>FY07</td>
<td>453*</td>
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<tr>
<td>FY08</td>
<td>513*</td>
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* Post consolidation
Revenue Share – By Country

Revenue Share FY 08:
- Domestic: 66
- International: 34

Revenue Share Q1 FY 09:
- Domestic: 47
- International: 53

Pie charts showing revenue distribution by country.
Product wise Revenue Mix - Consolidated

**FY 2007-08**
- Chemicals: 54%
- Fertilizers: 46%
- Others: 3% (Phos Acid)
- NPK: 12%
- DAP: 7%
- Urea: 17%
- Soda Ash: 37%
- Soda Bicarb: 3%
- Salt: 7%
- STPP: 2%
- Cement: 2%
- Others: 5%

**FY 2008-09 Q1**
- Chemicals: 54%
- Fertilizers: 46%
- Phos Acid: 17%
- NPK: 0%
- DAP: 16%
- Urea: 13%
- Soda Ash: 43%
- Soda Bicarb: 3%
- Salt: 4%
- STPP: 2%
- Cement: 2%
- Others: 0%
FY 2008 Financial Results

Revenue Split

- Chemicals: 55%
- Fertilisers: 45%
Highlights of FY08 Performance

- Acquisition of General Chemicals Industrial Products was completed in March ’08
- This acquisition makes TCL the 2nd largest Soda Ash Company in the world
Facility Overview – Surface Operations
Facility Overview - Mining Operations

- 1500 m below the earth’s surface
- 2,400 Miles of tunnels
- Shaft
- Conveyor Belt
- Miner
- Trona
Benefits of the GCIP Acquisition

STRATEGIC

• Gives the Company a presence in 4 Continents
• 60% of Company’s Soda Ash Capacity is now “Natural”
• Access to the world’s largest reserves of economically recoverable trona
• Access to Global Customers
• Ability to service customer requirements from optimal locations
• Access to Latin American Markets
• Mining of natural Soda Ash is “greener” than synthetic manufacture

OPERATIONAL

• Current Mine has 35 years of effective life
• Highly efficient operations
• High quality of Trona
• Earnings Accretive for TCL in 1st year
Highlights of FY08 Performance

✓ Acquisition of General Chemicals Industrial Products was completed in March ’08
✓ This acquisition makes TCL the 2nd largest Soda Ash Company in the world
✓ Healthy demand & favourable markets in both Chemicals & Fertilizers
✓ Babrala recorded the highest ever urea production – over 1 m tonnes
✓ Debottlenecking of the Babrala plant is absolutely on schedule
✓ Fresh Produce business opened its first distribution centre at Ludhiana
✓ Construction of our 1st Bioethanol plant in Nanded is also absolutely on schedule

• Production at Mithapur was affected by adverse monsoon conditions in Gujarat
• Political problems & commissioning delays in the Magadi Pure Ash Plant in Kenya
• Unprecedented rises in the costs of inputs and a global shortage of Sulphur
Other Highlights - Chemicals

• Total market share of Packaged Salt improved to 51% from 47% thanks to our 2\textsuperscript{nd} brand, I-Shakti (Market Shares: 44% Tata Salt + 7% I-Shakti).

• A Low Sodium Salt - Tata Salt Lite has also been launched

• Tata Salt was adjudged the No.1 “Most Trusted Food Brand” by the Economic Times [& No. 3 among all Brands]

• New 50,000 TPA Pharmaceutical & Food Grade Sodium Bicarbonate plant was commissioned in the Netherlands at a cost of Euro 15 m.

• Construction of the new 50,000 TPA Sodium Bicarbonate Plant in the UK for manufacture of ‘Briskarb’ - for treatment of Flue Gas, is on schedule and will be completed in early’09
Fertiliser - Urea

- Unprecedented Prices for fertilizers and fertilizer raw materials and the prices are continuing to rise.

<table>
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<tr>
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<th>12-18 months ago ($ / MT)</th>
<th>Today ($ / MT)</th>
<th>% Increase</th>
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<tbody>
<tr>
<td>DAP</td>
<td>180</td>
<td>1200</td>
<td>570%</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>566</td>
<td>2200</td>
<td>390%</td>
</tr>
<tr>
<td>Urea</td>
<td>250</td>
<td>800</td>
<td>320%</td>
</tr>
<tr>
<td>MOP</td>
<td>160</td>
<td>1000</td>
<td>525%</td>
</tr>
<tr>
<td>Sulphur</td>
<td>100</td>
<td>750</td>
<td>750%</td>
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- Fertilizer Subsidy burden is now ~Rs. 120,000 Cr. (and rising)
- Strain on Working Capital & Cash Management
Recent Policy Changes in Fertilizers

- Recognition of International Prices for Phosphate and Potash Fertilizers, for the first time (IPP) and a shift away from the manufacturer’s price based on “cost + permissible return”

- This will encourage efficient manufacturers to compete at international prices

- Similar policy expected for Urea - but only for additional capacity creation

- Subsidies continue to be a major concern
II. The Human Touch of Chemistry

Chemistry that puts a Smile on Your Face!
“In free enterprise, the community is not just another stakeholder in business but in fact the very purpose of its existence.”

*Jamshedji Tata*
*Founder, Tata Group, 1868*
‘Sustainability’ has always been a deeply engrained philosophy within the Group

The “Human Touch” of Tata Chemicals manifests itself through

B. Initiatives that make a difference

- to the communities we engage with
- to the environments we operate in

C. The use of modern chemistry to address some of World’s most worrysome problems

<table>
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<th>A Quick Collage</th>
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<tbody>
<tr>
<td>Unique Innovations at Mithapur</td>
<td>2</td>
</tr>
<tr>
<td>New technologies at our Innovation Centre</td>
<td>3</td>
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</table>
The Company that Cares
Mithapur

- Water Management – 3000 Ha, 1000 households, 733 Farm Ponds and 68 Community Ponds, 58 Community wells and 4 Bore Wells
- Afforestation – 20 Ha.
- Self Help Groups – 203 Group, 3382 Members
- Rural Entrepreneurship – 817 Enterprises
- Handicrafts – OKHAI – Showroom in Ahmedabad
- Rural BPO – UDAY – employment for 186 youth
- Health Education & Sanitation – 175 Bed Hospital, 42 Mobile Clinics
- Whale Shark – Saving an endangered species
- Infrastructure – Roads, Houses, Toilets, Community Halls
- Projects just starting: Mangroves, Coral Reefs, Marine Turtles
Mithapur

Farm Ponds

Rural Entrepreneur at his Shop

Okhai Women with Press

Check Dam

Handicrafts Training

Displaying their craft

Self-Help Group Training

Rural BPO

Saving the Whale-Shark
Babrala

- Crop Diversification – High Yield Wheat & Vegetables, 466 Farmers
- Land Reclamation - 350 Ha., 855 Farmers in 10 villages
- Animal Husbandry – Murrah Buffalo, Vaccination Camps & Cattle Shows
- Bio Gas – in homes
- Self-Help Groups - 88 Groups from 24 villages
- Income Generation - 13 artisans, Karobi Project (will merge with Okhai)
- Training in Vocations – Tailoring, Typing, Beauty Parlor, Mobile Repair, Computer Skills (1,109 boys & girls trained)
- Health, Education & Infrastructure – Mobile camps in 54 villages, AIDS Awareness Programmes, 3500 vaccinations, 2100 Pre and Ante Natal Checks
- Infrastructure – Roads, Culverts, Toilets
- Rural BPO starting soon
Babrala

Crop Diversification

Animal Husbandry

Income Generation

Self-Help Groups

Medicals Camps & Vaccination
Haldia

- Pond Management – Cleanliness, Pisciculture & Skin Disease Prevention
- Book Bank – 110 Students covered, in 4 schools
- Vision 20/20 – 3500 Students in 25 schools
- Innovative teaching methods – Training for teachers
- Pulse Polio & Blood Banks – Immunization programmes in 5 villages
Magadi

- Provision of Potable Water (by Magadi Rail)
- Patterson Memorial School & Higher Education Scholarships
- Adult education programmes
- Health – 60 bed Hospital
- HIV awareness programmes
- Drought preparedness programmes
- Local Community (Masai) Programmes
  - Employment
  - Micro Business
  - Cattle Trade
- Recipient of Good Citizenship Award for last 7 Years
Magadi

Train Carrying Water

A Typical Masai Family

Students at the Patterson High School

AIDS Awareness Programmes

Helping with Cattle Trade
1. Solid Wastes from Soda Ash

- For every tonne of Soda Ash, the Solvay Process produces 10 m3 of waste liquor and 0.4 Tonnes of solid wastes.
- Most Manufacturers, even in advanced countries, discharge these wastes into the sea or rivers or stored in settling ponds.
- At Mithapur all solid wastes are filtered out of the waste water using a battery of 6 Larox filters (each costing >Rs. 6 Cr.) and the solid wastes are mixed with fly ash to make Cement.
- This is done on a small scale in Japan and was once attempted in Poland.
1. Nano Filtration of Sea Water

- The removal of Calcium, Magnesium and SO4 from sea water using Nano Filtration Membranes from process water
- This reduces the effluent load by around 200 MT per day
- Additionally it reduces the use of fresh water (which is very scarce in Mithapur District)
- This is a novel nano filtration technology and being used in a Soda Ash facility for the first time
- It involves an investment of Rs. 10 Cr. and adds ~Rs. 6 Cr. to annual operating costs
Sustainability Model for Mithapur

Corporate Social Responsibility (CSR)
- Regulatory Compliance
- Responsible Care
- Sustainable Community development
- Clean Technologies
- Emergency Preparedness

Sustainability Development (SD)
- Solar Energy
- Wind Energy
- Waste Recycling/Recovery
- Greening of Waste Land
- Wet Land Development
- Minimise Lake/Ground Water use, Desalination.

Products:
- Soda Ash
- Salt
- Cement

ISO 9001 / ISO 14001 / OHSAS 18001 / TBEM
RESPONSIBLE CARE
GRI Reporting

Clean Emissions

SOx, NOx, Dust Control

Technology Upgrades for Clean Production

CDM

Desalination

Waste water

Solids Separation, Chem Recovery & Recycle

Cement plant

Boiler Fly Ash

Sustainable Development

Soda Ash
Salt
Cement

Raw Materials/ Fuels

Seawater

Salt

Gypsum to Cement

Waste Bittern
Tomorrow’s Chemistry

Bio-Mimicry

Bio Fuels

Nano-Tech

TCL’s Innovation Centre
Planet Earth’s Problems

Industry challenges
- Energy
- Water
- Land
- Climate Change

Preliminary List of Opportunities
- ...
- ...
- ...
- ...

Attractive Technologies
- Bio-technology
- Nano-technology

Screening Criteria
- Market attractiveness
- TCL’s ability to deliver value
- Shift from high capital / unit profit to high knowledge / unit profit

Short-listed Opportunities
- .........
- .........
- .............

The Interface of Bio & Nano-Technology

GREEN CHEMISTRY
The Ultimate Energy Solution will come from either Biology & Nano-technology

Liquid
- Biodiesel
- Bioethanol

Gas
- Bio - H2
- Bio – CH4

Devices
- Fuel Cells
- Solar Cells

Biotechnology + Nanotechnology

Biological processes can be used for the manufacture of Nano-materials
What is Nanotechnology?

Nanotechnology is the art of manipulating matter at the nanometer* scale to create novel structures, devices, and systems.

- **Structures** (e.g. materials)
- **Devices** (e.g. sensors)
- **Systems** (e.g. NEMS**)

**Novel Uses**

* 1 Nanometer = 1 Billionth of a Metre
**NEMS - Nano Electro Mechanical Systems

**Visualizing the Size**
- Atoms < 1 nm
- DNA ~ 2.5 nm
- Cells thousands of nm
The attractiveness of Nano-technology

Properties of Nano materials

- High chemical reactivity (surface modification, biocompatibilization, catalysis.....)
- Extremely high surface/volume ratios (catalysis, drug delivery, enhancing properties of composites)
- Can be coaxed into environments not accessible to larger objects (drug delivery, gene therapy.....)
- Exotic electronic and optical properties (molecular electronics, non-linear optics, biodiagnostics.....)
The attractiveness of Nano-technology (2)

Some potential applications

- **Drug delivery** - through the skin and eyes, inhalation, to avoid stomach enzymes, delayed release and targeted drug delivery
- **Solar energy** - more efficient and cost effective solar cells
- **Fuel cells** – employing nano-metal oxides
- **Hydrogen Storage** – to reduce the volume and temperature
- **Display technologies** - Nanotube-based field-emission displays may replace liquid-crystal displays
- **Storage technologies** – in IT. Miniaturized Drives / RAM’s
- **Nanotubes** - Multiwalled nanotubes, for making composites. Give greater conductivity at much lower filler loads
- **Catalysis** – putting to use the enhanced surface area of the catalyst.
Potential applications (contd.)

- **Nanocomposites** - clay-based composites for structural applications (increased strength) or with novel properties like better insulation (for automotive and aerospace industries)
- **Coatings** - extra hard / special properties – hydrophobic, electrochromic, self-cleaning – for cars and buildings
- **Sensors** - bio and chemical sensors from nanowires and nanotubes
- **Textiles** - stain-resistant clothing, electrospun nanofibres & nanotube-enhanced fibre
The Human Touch of Chemistry – Innovation Centre

1. Adapting cutting-edge technology to the meet the needs of the economically under-privileged
   - Low cost water filter with nano technology

2. Addressing wellness of the communities we serve
   - Iron fortified salt
   - A Food Additive that can reduce intake of cholesterol & Improve intake of calcium
   - Low cost sweetener from green process

3. Developing technologies that would be sustainable and green
   - Microbial / green process for the production of inorganic nano particles
   - Production of fuels from biomass (cellulosic ethanol)
   - Use of CO$_2$ in new polymeric materials
Examples of Chemistry that has made or will make a difference in future

- Recovery and recycle of wastes at Mithapur – cement
- Water conservation projects at Mithapur
- Energy Efficiency at Babrala
- Customised Fertilizers
- Biofuels from conventional routes + Energy from waste (Cellulosic Conversion of Biomass)
- Nano Metals for Fuel Cells (made from biological processes)
- Nano-silica for PV Cells
- Energy Efficient Coatings for Glass
- Biotransformation of glycerol to other uses
- Use of CO2
Thank You