Confederation of Indian Industry

Energy Efficiency Technology Workshop

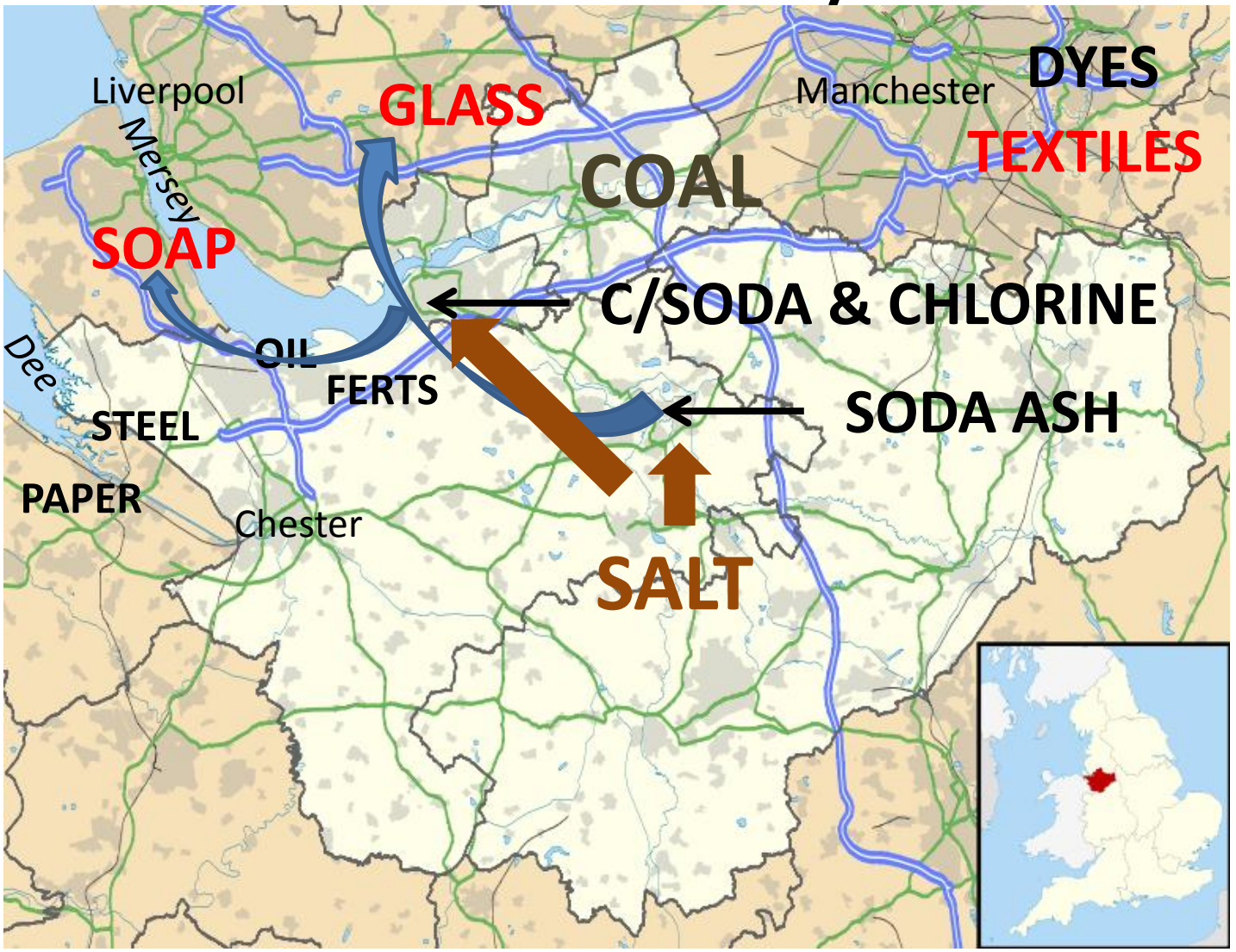
Mumbai 16th November 2011

Sector level insight - Chemicals

Dr Mike Hancock

DEE ASSOCIATES

Chemical Industry - NW



History – main events

1820s – Pilkington Glass beer bottles

1860s – Mr Lever, general wholesaler

1870s – Mr Brunner & Mr Mond licence “Solvay” Process

1880s – “Sunlight Soap”

1920s – Formation of ICI

1930s – Shell refinery

1950s – Mr Alistair Pilkington’s “Float Glass” process

1960s – Shellstar fertiliser plant

Global ownership today

Site:	**Group owners:**
Pilkingtons	NSG Group (Japan)
Lever Brothers	Unilever
ICI Alkali	Ineos (Jim Ratcliffe)
Brunner Mond	Tata Chemicals
Shell refinery	Essar Energy
Shellstar	Growhow (Terra)

Energy challenges & solutions

- Chlor-alkali - electricity costs
  - Gas CHP plant
  - Energy from waste plant – Approved for 2013

- Ammonia-soda - steam costs
  - Gas CHP plant
  - Energy from waste plant – Proposed

- Fertiliser - conversion on gas
  - Optimised design
  - Radial flow ammonia converter
  - Scale of plant

Operational issues

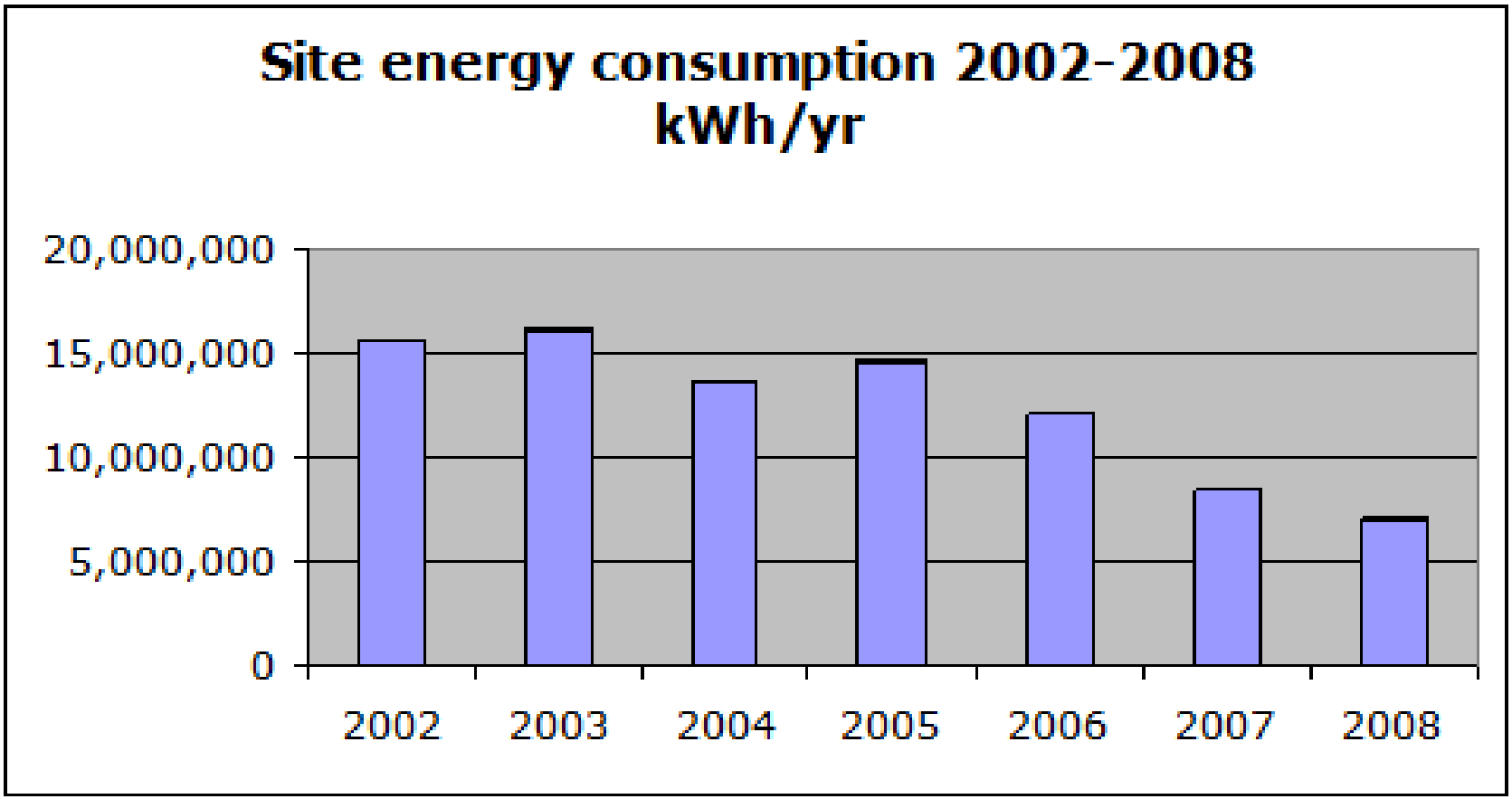
- Steady operation
  - Initial design & engineering
  - Planned maintenance
  - Supply and distribution scheduling
  - Control systems
- Continuous upgrading and investment - budgets
  - The “40 year old broom”
  - Has had 10 new handles and 20 new heads
  - Each one bigger and better than the last
- Steam losses
  - Monitor steam quality
  - Check lagging
  - Leak repair programme, traps, condensate return
  - Electric motors vs steam
  - Boiler maintenance

The Carbon Trust

- Accredited independent energy consultants
- Site surveys – Opportunities assessments
- Comprehensive site report
  - Energy consumption validation
  - Benchmarking
  - Quantified energy, CO_2, value savings
  - Estimated implementation costs
  - Detailed description of actions and best practice

Case studies

- Resins factory: 2,300tCO_2 £450,000/y savings

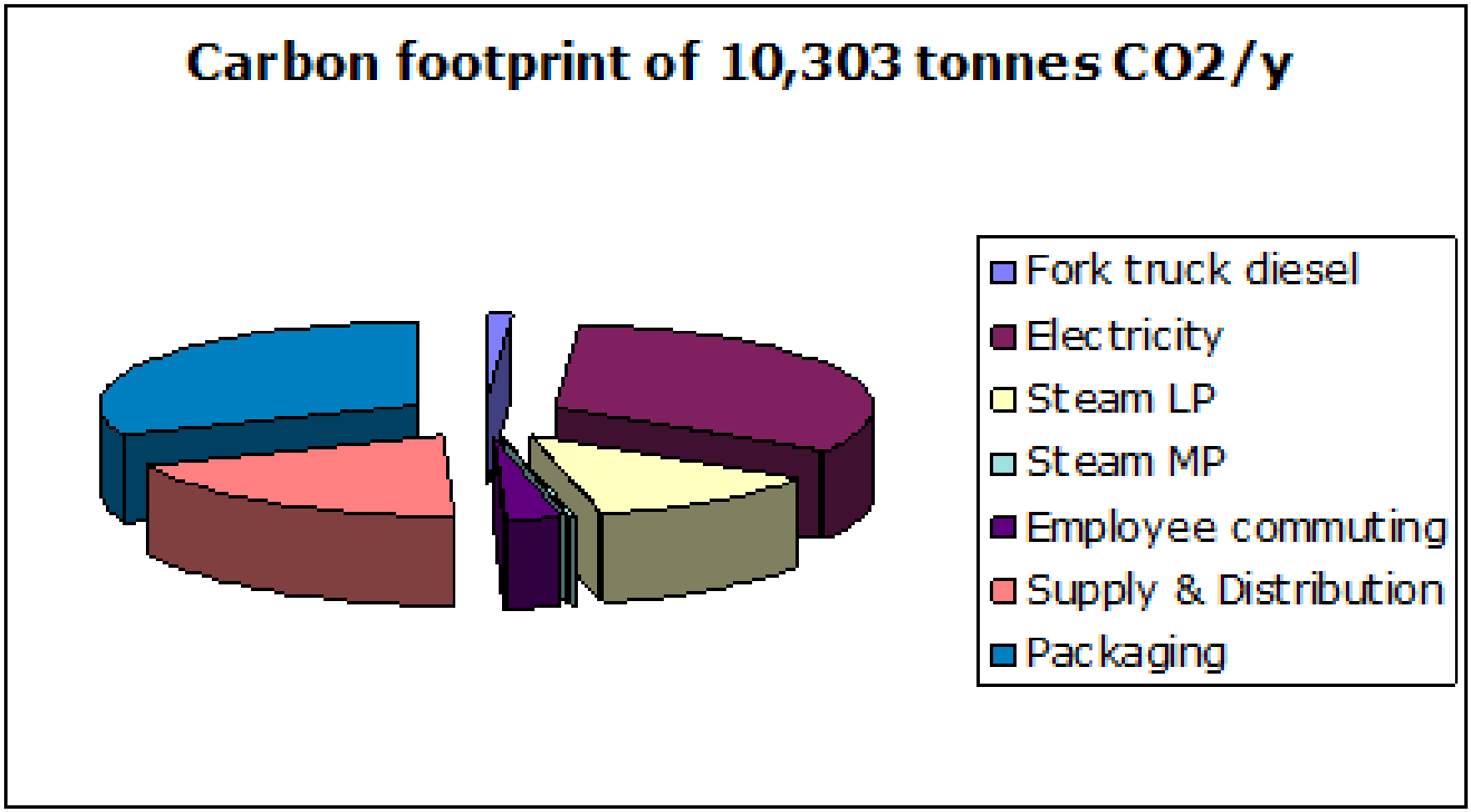


Case study Resins – 64 measures

Measure	kWh/y saving
Site rationalisation	3,160,000
New steam boiler	1,500,000
New gas burners	1,000,000
Variable speed drives	810,000
Insulate steam pipes	700,000
Agitator replacement	600,000
Compressed air revamp	315,000
CHP plant	200,000
Control system upgrades	200,000
Oil heater upgrade	200,000
Turn off unwanted lights	130,000
Nitrogen flow control	100,000
Close electric substation	100,000
Power factor correction	100,000
Low energy lighting	60,000

Case Studies

- Oil blending: 1,400tCO_2 £190,000/y saving



Case study oils – 17 measures

Measures	kWh/y saving
Energy management	850,000
Condensate heat recovery	980,000
Rationalise light fittings	410,000
Process energy analysis	390,000
Vessel pipework etc insulation	250,000
Rationalise buildings use	230,000
Compressor replacement	210,000
Steam quality improvements	170,000
Compressed air leak detection	100,000
Improve lighting control	100,000
Compressed air heat recovery	130,000
De-stratification fans	65,000

Energy management

- Policy and strategy
  - Appoint an energy champion
  - Develop and communicate a policy
  - Develop a strategy and action plan with targets
  - Monitor progress and revise/update
- Create an awareness
  - Train
  - Promote
  - Reward
- Measurement and control
  - Install the best control systems
  - Train staff in their use
  - Monitor progress

Thank you

Dr Mike Hancock 44 7799771352

Dee Associates mike@dee-associates.com

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Business Consultants