VERTICAL SHAFT BRICK KILNS

A Technology for Cleaner Brick Making

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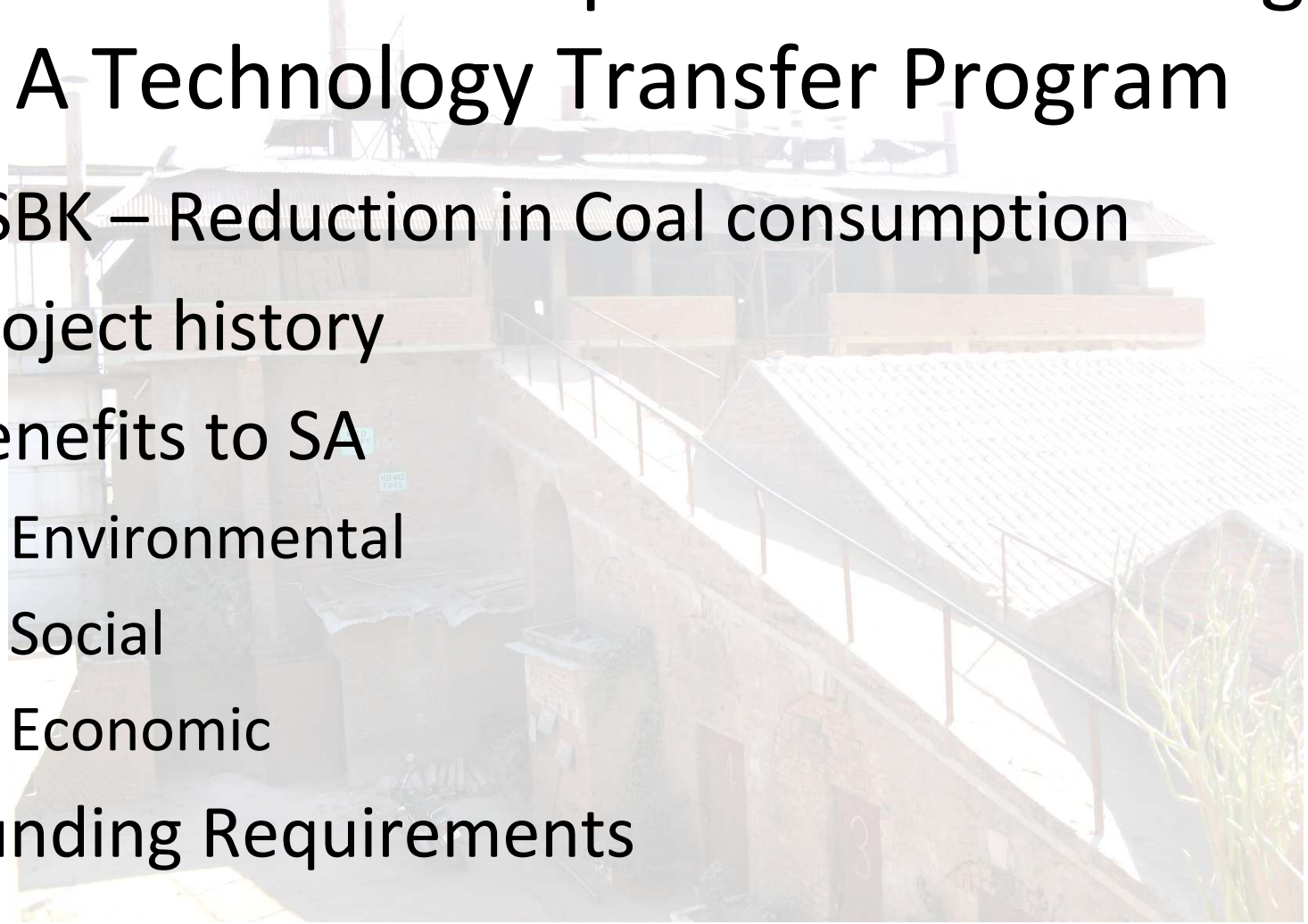
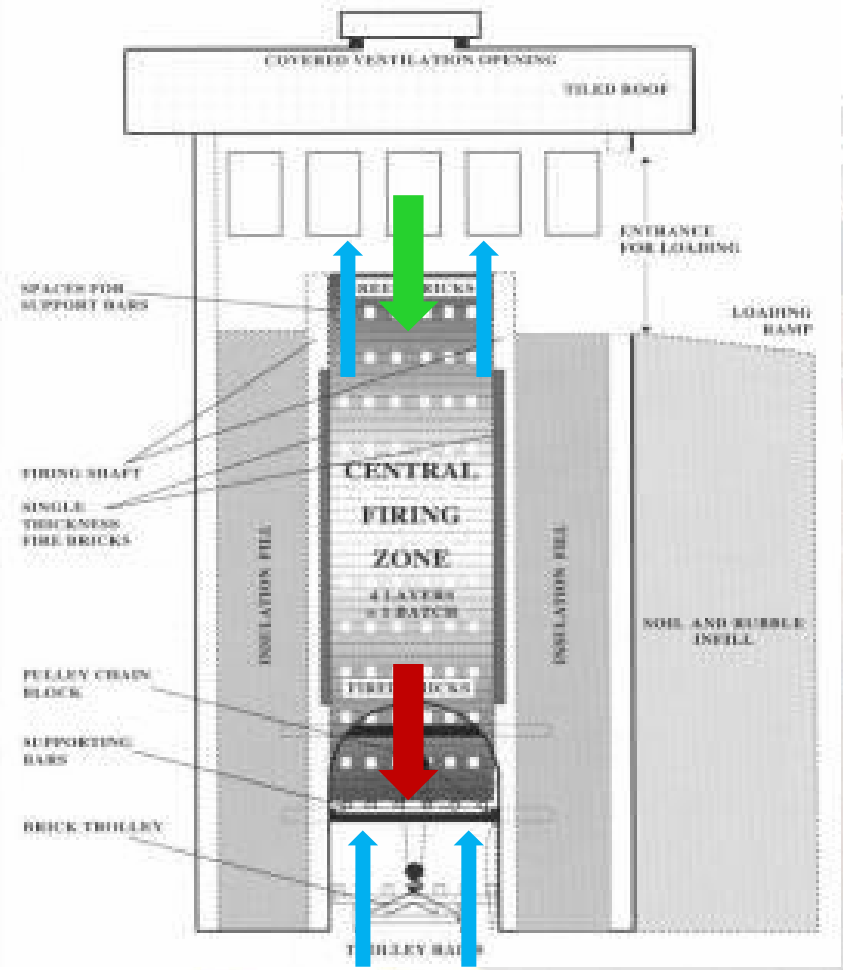
Environmental Improvement Through A Technology Transfer Program

- VSBK – Reduction in Coal consumption
- Project history
- Benefits to SA
  - Environmental
  - Social
  - Economic
- Funding Requirements



Most Energy Efficient Brick Firing Methodology



- Chinese design
  - Updraft Kiln
- Indian improved
- Continuous process
- Counter current principle
- Indian CDM registration
- 0.84 Mj/kg
- Clamps: 2 – 3.5 Mj/kg

Project history

- Initiated by the brick makers — Nov 2008
- Technology Transfer assistance from SDC
  - Pre-feasibility workshop — Feb 2009
  - Feasibility budget approved — Mar – Oct 2009
  - TTP Budget approved — Oct 2009
- Interaction through the following:
  - Design and planning workshops
  - Technology assessments
  - International visits (Both way)
- Project Facilitation Unit established to co-ordinate TTP
- Pilot sites are ready to start subject to funding

Sustainability Benefits of VSBK

- Environmental based project
  - Coal consumption reduction potential
    - Clamps 280g Coal / Brick
    - VSBK 130g Coal /Brick
  - 80% of 5 Billion bricks produced in Clamps
    - Target 50% of production: 2.5 Billion bricks
    - Coal reduction 375,000 tons per Annum
    - CO_2 reduction 750,000 tons per annum (2:1)
  - PPM emission reduction 80-90%
  - Measurability improvements – single point source

Sustainability Benefits of VSBK

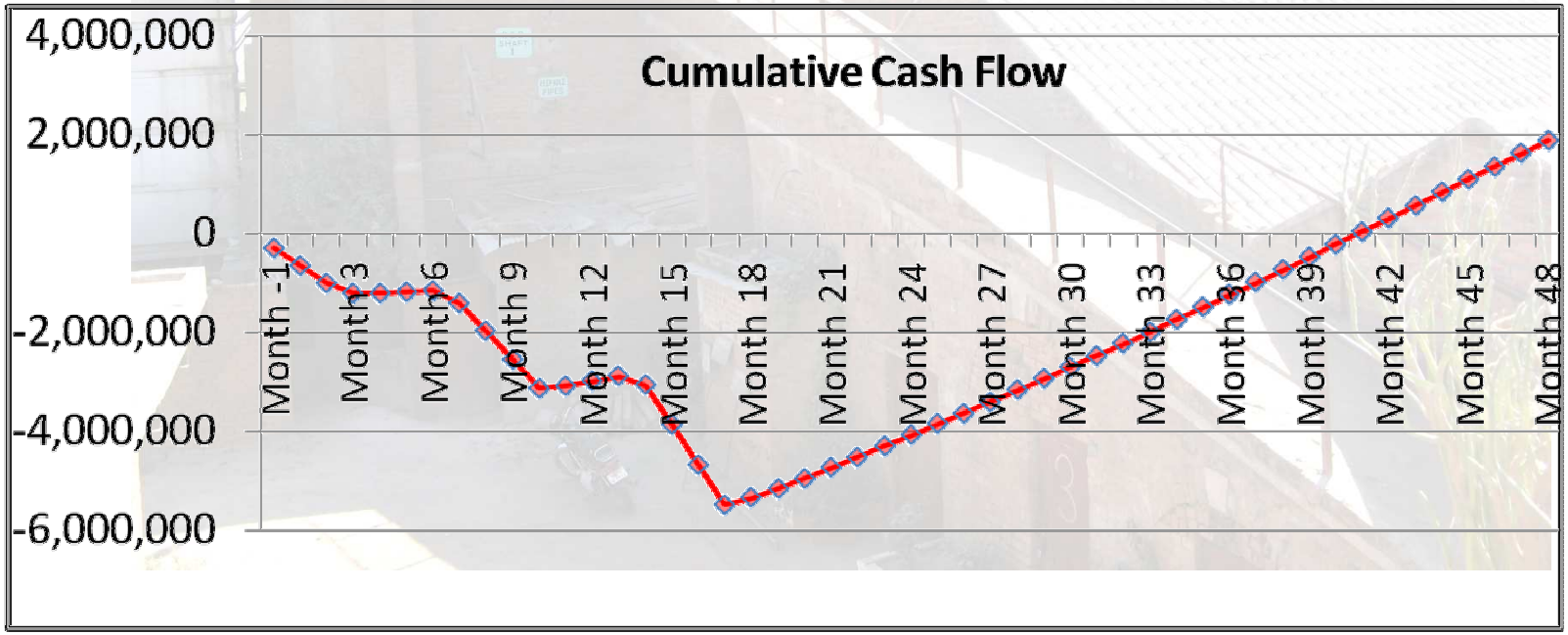
- Social
  - Increased skill levels required
    - Complexity of process
    - Up skilling of key personnel
    - Shift cycle increases number of skilled workers
    - Average remuneration increase
  - Improvement in working conditions
    - Reduction in emissions in work place
    - Reduced dust and particles
    - Under roof versus open air

Sustainability Benefits of VSBK

- Reduction in production costs
  - Coal accounts for 20-40% of production costs
    - Geographical location
    - Fuel types (Washed Spiral / Boiler Ash)
  - 25-30% of handling in clamps is non saleable
  - Reduced breakage between 5-10%
- Broad based financial benefits
  - Capital expenditure required R700 Million
  - 950,000 man days of work during construction
  - CDM capital inflows for POA over R1,5 Billion
  - POA Gold Standard feasibility conducted

Individual Brick Yard Benefit

	Capital Required	Monthly Savings
Phase 1: pilot	R1,200,000	R44,033
Phase 2: Production 1	R2,085,000	R88,065
Phase 2: Production 2	R2,985,000	R132,098



Funding Requirements

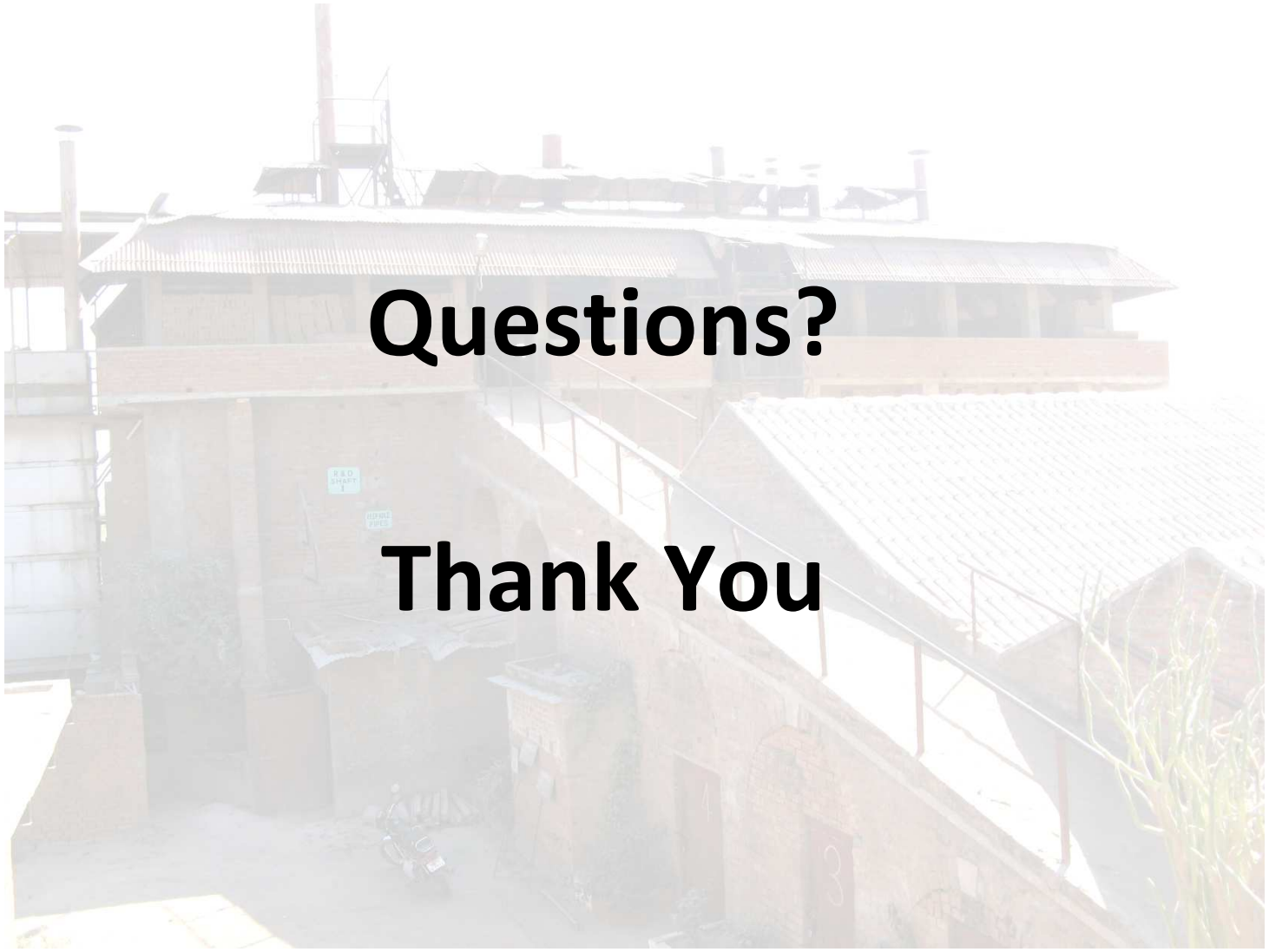
- Pilot Shafts
  - R1,200,000 for a set of 2 shafts (3 participants)
  - Need to test and validate local savings
- Section 21 operational costs
  - R4,000,000
  - Market and deliver the technology (Open Source)
  - Coordinate and promote CDM
- VSBK Capitalization Fund
  - R700 Million required if objectives are achieved
  - Reduced barriers due to CDM

Funding Efforts to Date

- Initial thinking
  - Pilots done from own cash flow
  - Market conditions do not allow
- Institutions approached
  - DBSA - Grant funding
  - IDC - Grant and bankable funding
  - DTI – Grant and bankable funding
  - Provincial Government – Grant funding

Accessing funding is not dependent on the strength of the project , it is dependent on the decision makers and their agenda's

This is a model project and should be able to access funding", DBSA
"Great project with excellent sustainable benefits", DTI
"This project is much needed and in our sweet spot", DEAT
"This project meets the stated mandate of reducing GHG emissions as stated by Government", IDC



Questions?

Thank You