

Energy Efficiency Intervention in the Rolling Mill Cluster in Bhavnagar (Gujarat), INDIA



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Mandate of the Intervention

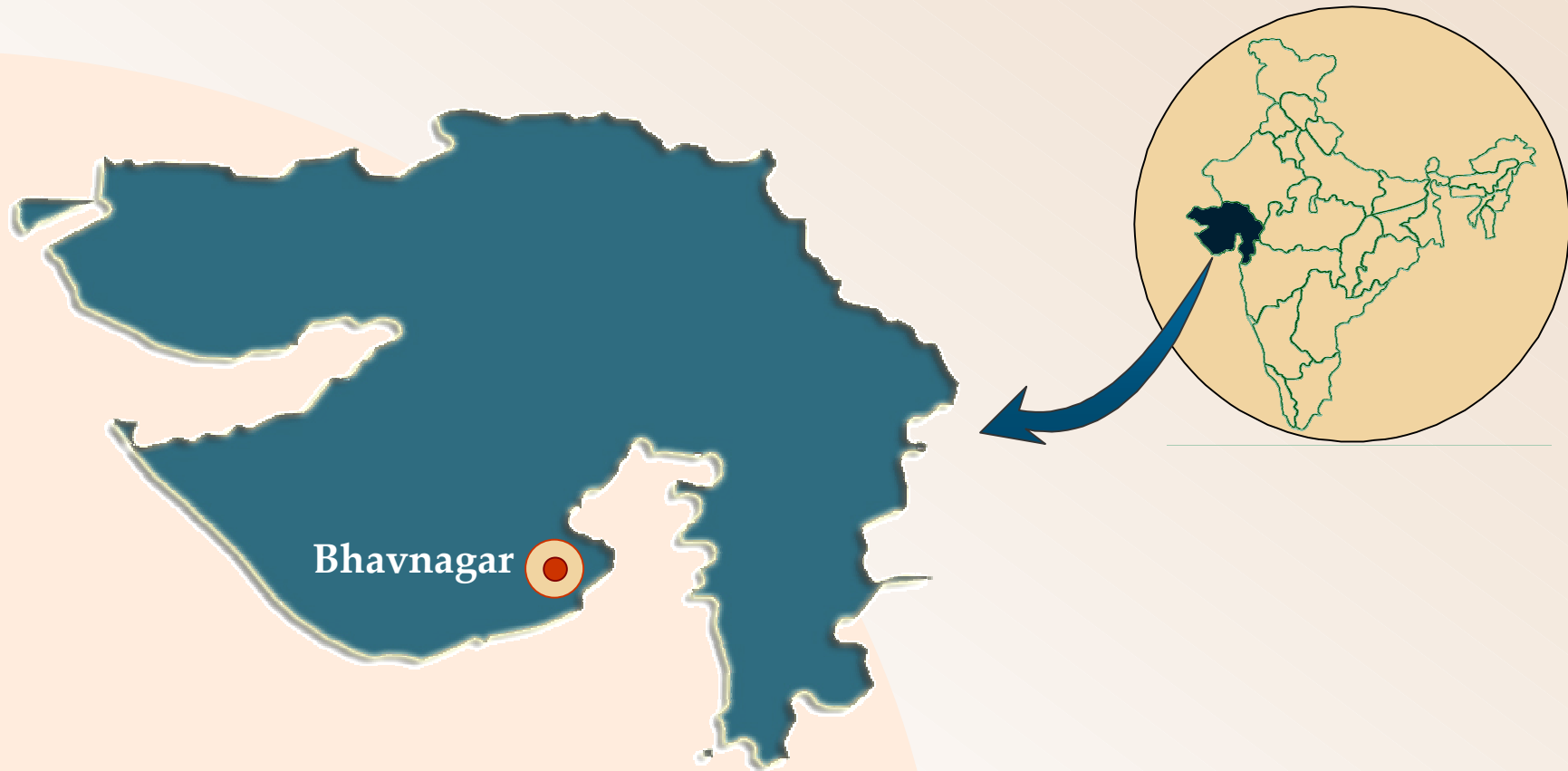
Goal

- Reduction in GHG emissions from Indian industrial sector leading to mitigation of global warming

Specific objectives

- To reduce the GHG emissions from rolling mill cluster in Bhavnagar, Gujarat state of India
- To upgrade existing inefficient and polluting system to an energy efficient, environmentally benign and economically viable system
- To upscale and diffuse the developed technology within the target cluster and to other clusters

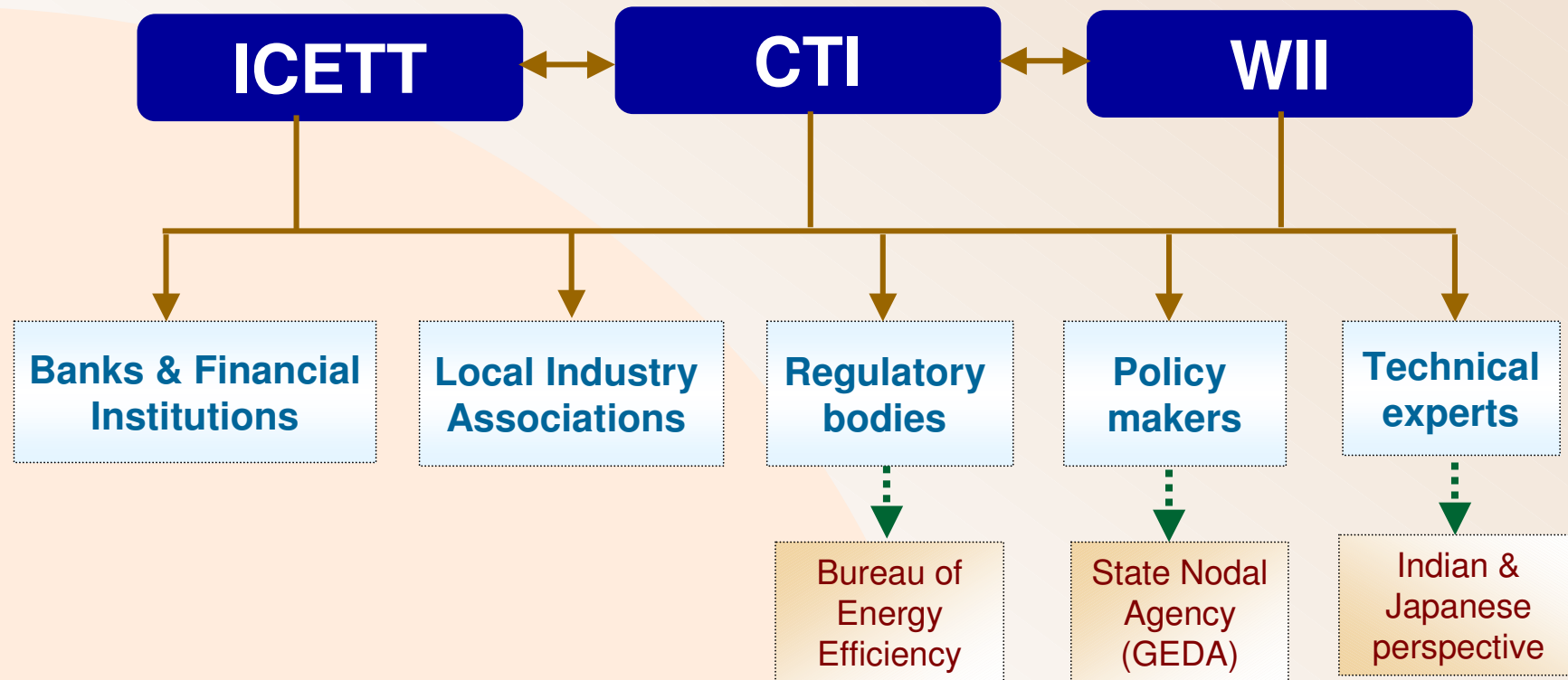
Location of the intervention



Bhavnagar

Rolling mill cluster in Gujarat

Program Structure



Background of re-rolling sector in India

- Approximately 2000 rolling mills in India
- 80% of the units fall in SME category
- Most rolling units exist in clusters in different parts of the country
- Highly energy intensive and inefficient sector
- Sector has remained relatively insular from the technological developments over the years
- Cumulative energy consumption - 1.6 MTOE / annum
- Proven energy saving potential - 20-25%



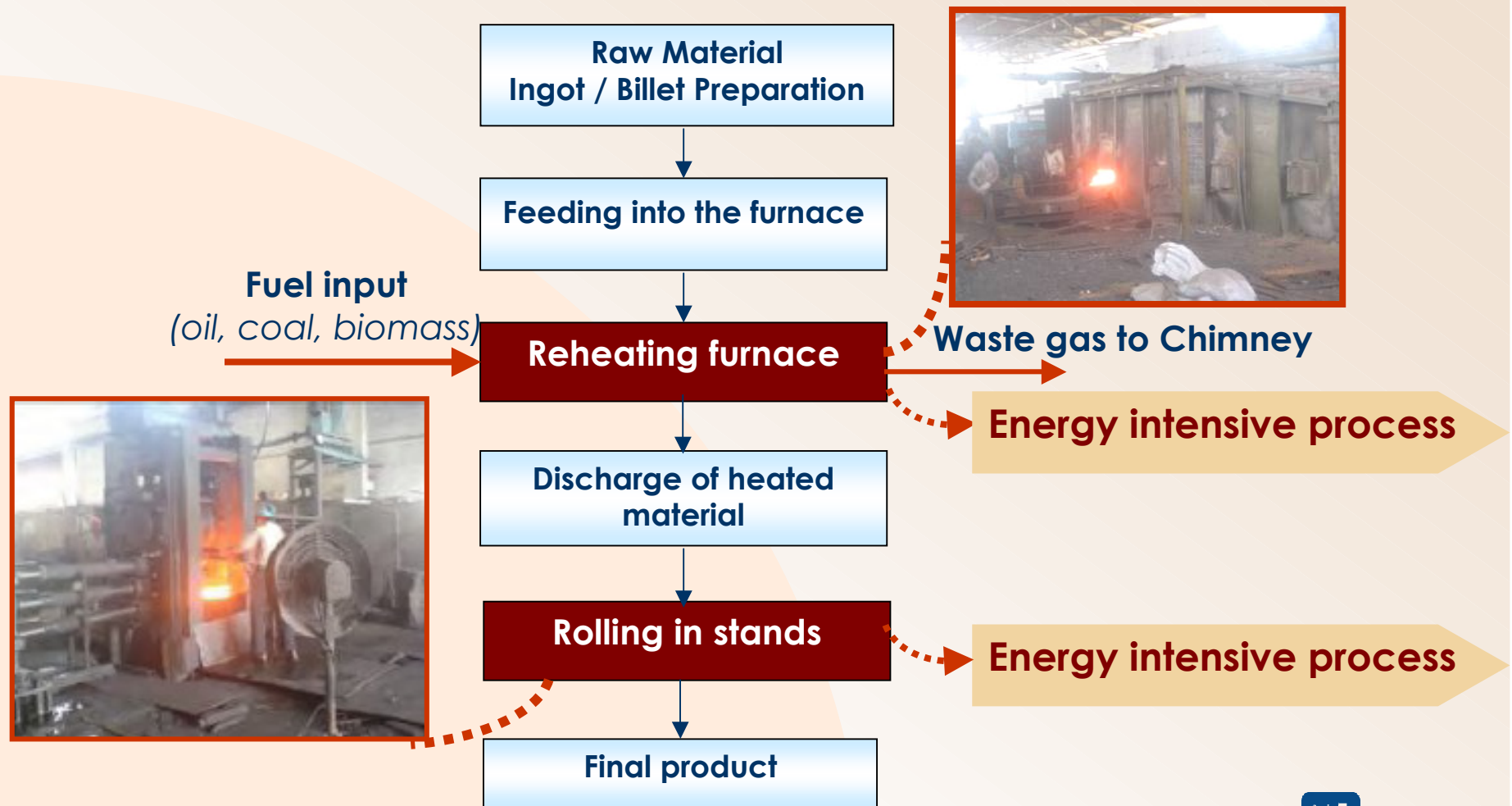
Rationale of the project to be based in Bhavnagar cluster

- Any technological intervention for rolling mills in India needs to be cluster based
- Bhavnagar rolling mill cluster is the most representative one
- Approximately 100 small and medium rolling units
- Most of the units use highly inefficient and polluting technologies/practices, thus providing huge opportunity for energy savings and GHG emission reduction
- Most of the units have switched over from oil to coal in recent years due to spiraling oil prices

Barriers faced by rolling industry in implementation of EC measures

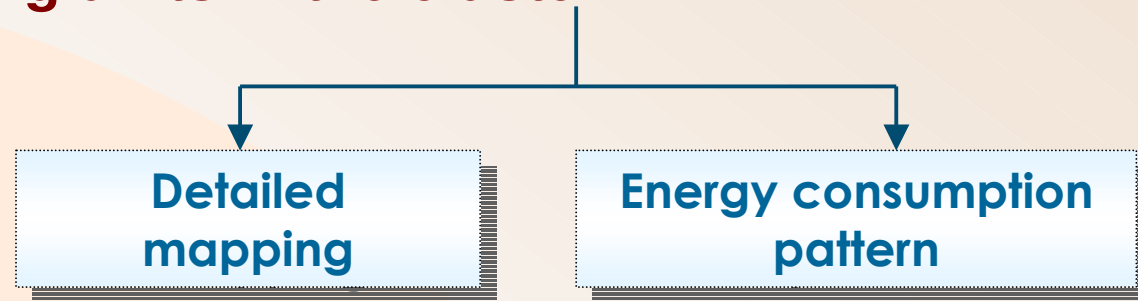
- **Absence of technological solutions to suit the specific requirements of small and medium rolling units**
- **Absence of credible local technology suppliers**
- **Lack of awareness amongst entrepreneurs that EC measures can really improve profitability of their units (many past interventions have remained restricted to feasibility studies)**
- **EC financing, specially to Small and medium industrial sector is still perceived as risky proposition by local banks**

Process flow chart for rolling units

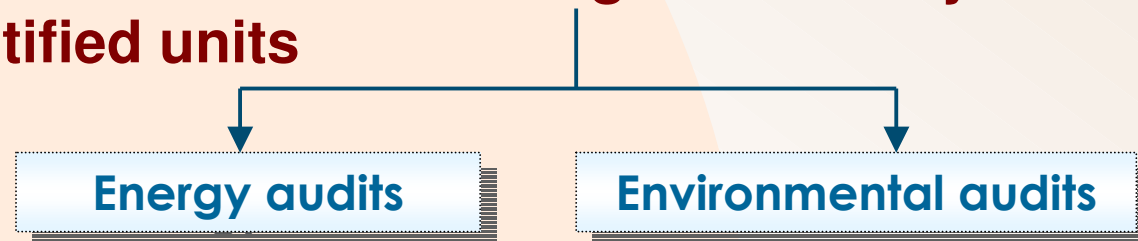


Approach & Methodology

- Carry out systematic inventORIZATION / survey of the rolling units in the cluster



- Take local industry association on board to identify four representative units
- Undertake exhaustive diagnostic study of the identified units



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Approach & Methodology

- **Based on the results of diagnostic studies, identify possible cleaner technology options**
- **Undertake techno-economic viability and life cycle analysis of each chosen option**
- **Undertake a detailed design of the most preferred technological choice**
- **Detailed analysis of potential reduction in energy consumption / GHG emissions and CDM ability of the improved technology**

Proposed Steps - *Next Phase*

- **Demonstration of the improved and efficient technology in selected units**
- **Conducting a post demonstration monitoring to evaluate the actual reduction in energy consumption and GHG emissions**
- **Dissemination of the demonstration project outcomes**
- **Preparation of a blueprint for upscaling the technology**
- **Facilitation for establishing a delivery system through training and capacity building to catalyze the technology replication**

Salient Features of the Intervention

- **Action oriented approach**
- **Intervention tries to address inherent barriers which inhibit implementation of EC measures in typical SME clusters**
- **Completely participatory approach**
- **Developed technological solution to be as homegrown as possible**
- **Not reinventing the wheel / Incorporating learnings from past experiences**
- **Specific emphasis on the financial viability of the technology and development of delivery system so as to make the replication self sustainable**

State Level Potential

Number of rolling units in Gujarat	200
Average production capacity	50 tonnes/day
Average specific energy consumption	0.045 TOE/tonne
Average oil consumption per unit	2.25 tonnes/day
Average oil consumption for 200 units	450 tonnes/day
GHG reduction by reducing 20% energy consumption in each unit	0.1 million tonnes per annum*

** Assuming emission factor for oil as 3.26*

National Level Potential

GHG reduction potential for the complete rolling sector in India	1 million tonnes per annum
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Way ahead...

- Dynamics of Bhavnagar rolling mill cluster representative of most of the SME clusters in India
- Potential ripple effect is huge, not only in the rolling sector, but across sectors
- Successful execution of the present programme can be an ideal example for similar future interventions

Thank You

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