Design and Demonstrate an ESCO business model to promote EE motors in chemical industries in Gujarat

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International Copper Association India
Copper Alliance

SHAKTI SUSTAINABLE ENERGY FOUNDATION

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Structure of the presentation

- Rationale
- Precursor: TERI-ICAI Initiative
- Selection of cluster
- Summary of study
- Study approach
- Proposed Vendor Based ESCO Model
- Proposed role of key stakeholders
- Key Financial Indicators

Rationale

- Electric motor systems account for about 55% of global industrial electricity consumption and close to 70% of industrial electricity demand.
- In India, about 45% of the total electricity generated is consumed by industries, of which 70% share is of electric motors.
- Electric motor driven systems include pumps, fans, compressors, blowers, agitators and so on.
- Energy efficient motors form a major component in contributing to the energy saving by way of increased efficiency of the system itself.

Motor – Efficiency standards

Efficiency Levels	Efficiency Classes	Testing Standard	Performance Standard
	IEC 60034-30	IEC 60034-2-1	Mandatory MEPS
	Global 2008	incl. stray load losses 2007	Policy Goal
Premium Efficiency	IE3	Low Uncertainty	USA 2011
			Canada 2011
			Europe* 2015 (>7.5 kW), 2017
High Efficiency	IE2		**USA**
			Canada
			Mexico
			Australia
			New Zealand
			Korea
			Brazil
			China 2011
			Switzerland 2011
			Europe 2011
Standard Efficiency	IE1	Medium Uncertainty	**China**
			Brazil
			Costa Rica
			Israel
			Taiwan
			Switzerland

bold means in effect

*) IE3 or IE2+VSD

Precursor: TERI-ICAI Initiative

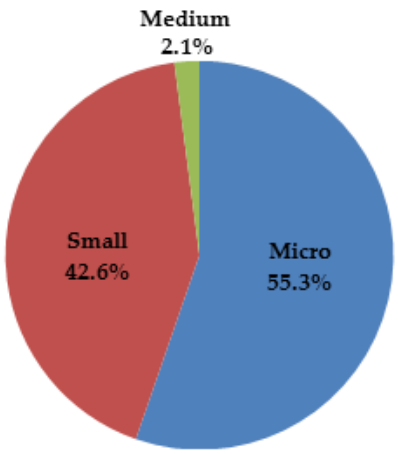
- TERI and ICAI undertook a collaborative applied research project on “Promotion of Energy Efficient Motors in Chemical Industry in India”.

Objective

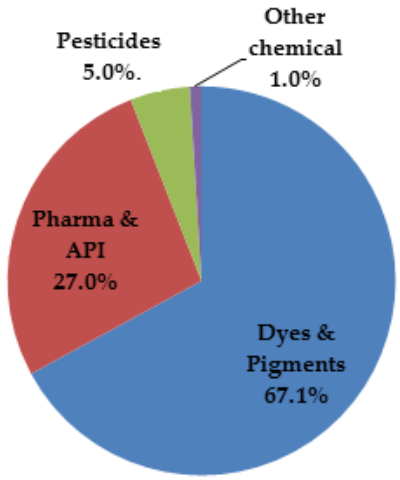
- ✓ The objective of the study was to estimate the overall energy consumption and energy saving potential in electric motors at Ankleshwar Industrial Cluster
- ✓ Development and demonstration of identified energy conservation measures (i.e. high efficiency motors).

Selection of chemical cluster - Ankleshwar

- Ankleshwar chemical cluster constitute more than 1,200 industries manufacturing Dyes & Pigment, Pesticides, Pharma & API and other chemical products
- Cluster already sensitized on energy efficiency aspects during implementation of SIDBI-WB-GEF project



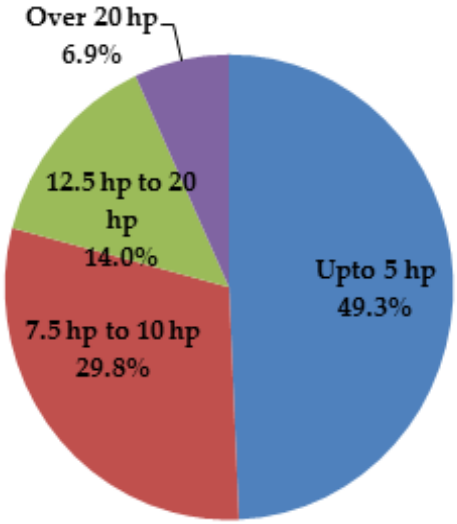
Classification of Units

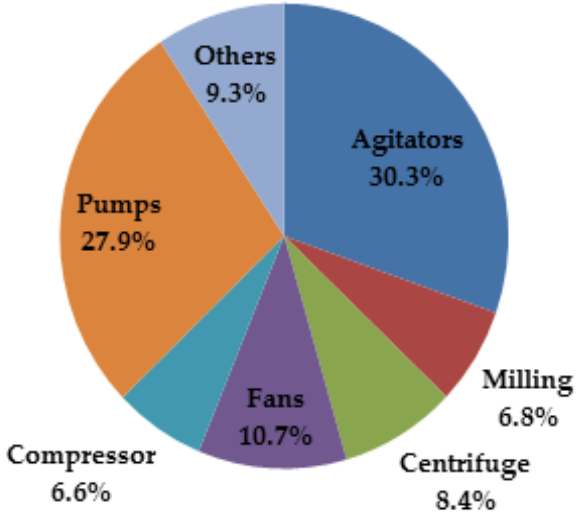


Classification based on product

Motor profile - Ankleshwar

- Based on data, there are about 750 operational chemical units having population of about 12500 electric motors (3 – 125 hp).
- Most of the installed motors are standard category.



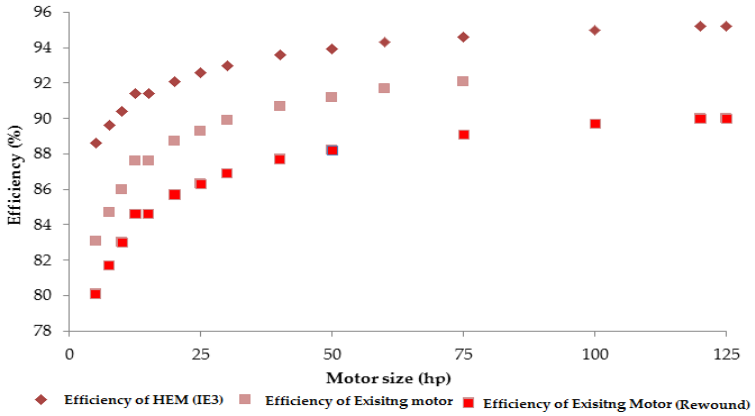






Summary of Study

- Average improvement in efficiency (for all capacities) is estimated to be 5.1%
- About 85% of the installed motors are below 20hp capacity.
- Estimated energy savings (up to 20 HP motors) – 5.6%
- Simple payback period – about 2 years
- Four units have already adopted HEM during assessment period.



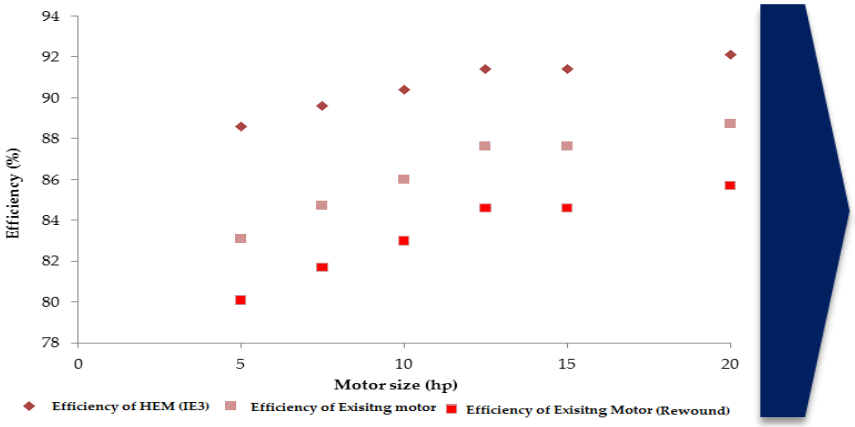
Number of motors	No	454
Annual electricity consumption (ext)	Mill Units	19.3
Annual electricity consumption (pro)	Mill Units	18.2
Annual electricity saving potential	Mill Units	1.1
Monetary saving potential	Mill Rs /yr	7.1
Investment required	Mill Rs	17.2
Simple payback period	year	2





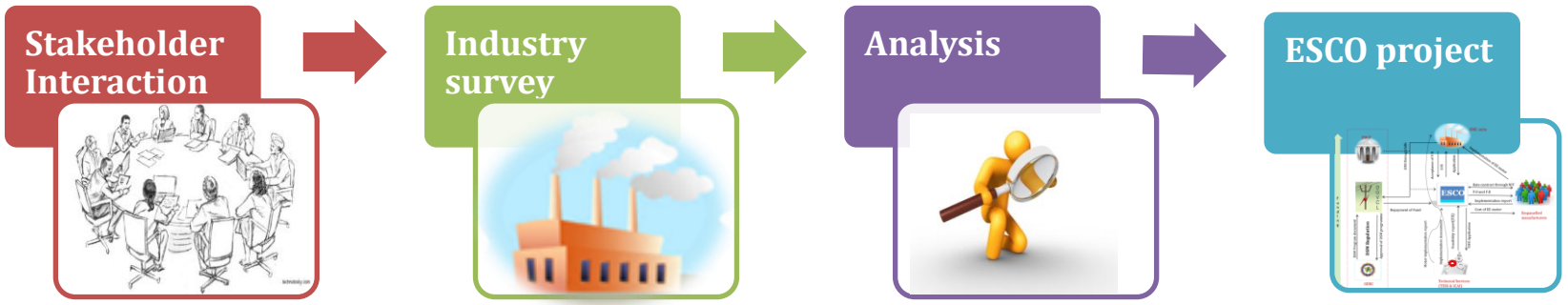
Approach followed

Targeted category – up to 20 hp



Designing an implementable scheme for penetration of high efficiency motors

Approach :



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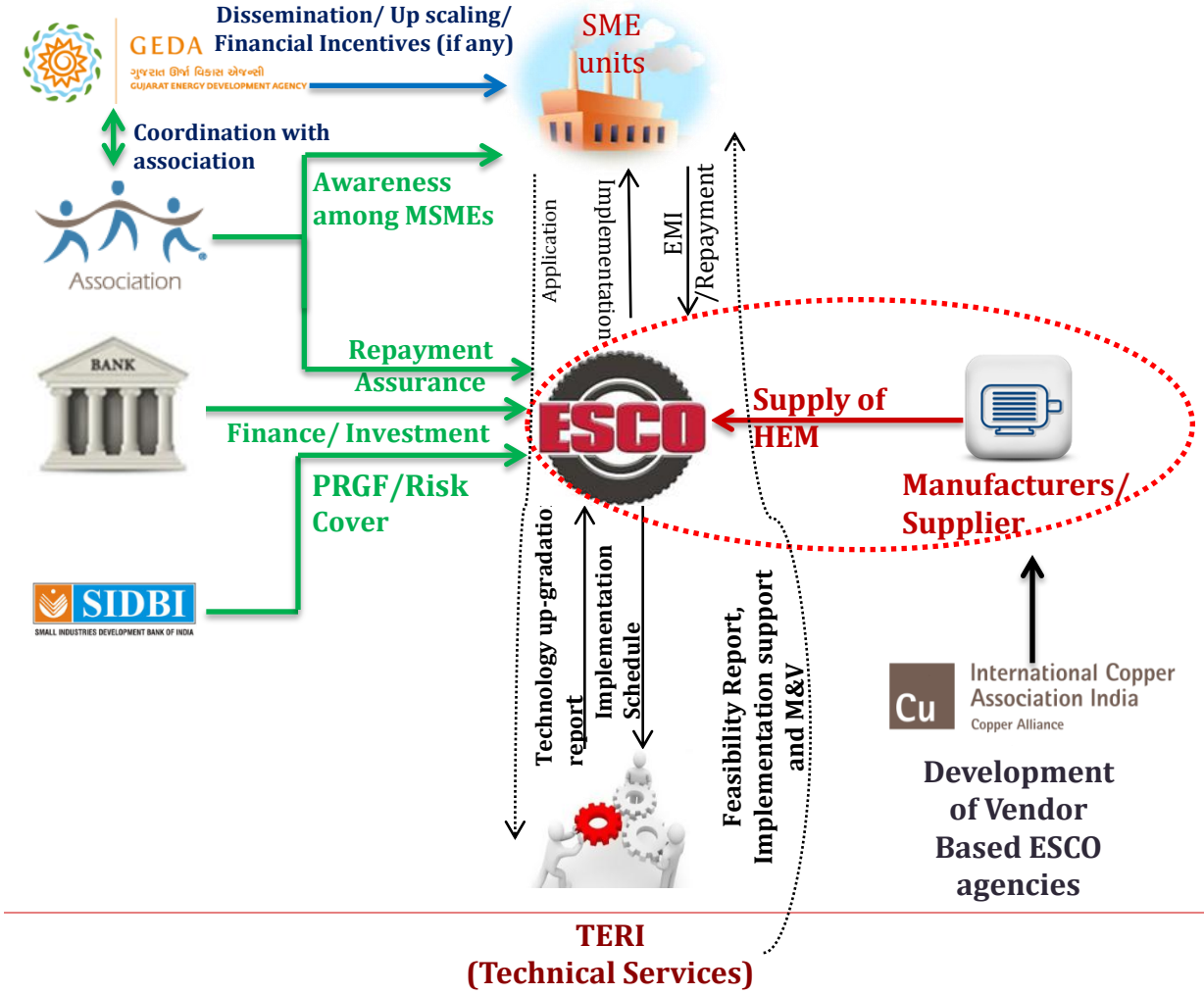
Institutional mechanism : Vendor based ESCO model



Key features:

- ✓ Open to all: Any unit (new/existing) which is an industry association member
- ✓ All ESCOs/ Manufacturer/ System Integrator / OEMs can participate
- ✓ No initial investment for adoption of HEM
- ✓ ESCO's risk on investment is mitigated by Partial Risk Guarantee Fund by SIDBI
- ✓ Replicability in other MSMEs clusters

Role of key stakeholders

TERI

- ✓ Providing overall technical support
- ✓ Monitoring of overall program
- ✓ Preparation of feasibility reports
- ✓ Maintaining and upgrading data base
- ✓ Monitoring of implementation process
- ✓ Monitoring and verification

GEDA

- ✓ Creating awareness among units
- ✓ Disseminating results in other clusters
- ✓ Coordination with Industries Associations for development of SPV
- ✓ Providing financial incentives (if any) to participating units

ESCO/Technology Providers

- ✓ Initial investment for HEM
- ✓ Installation of HEM
- ✓ Collection of payment from participating units
- ✓ Maintaining the services

Associations (AIA/PIA)

- ✓ Repayment Assurance
- ✓ Awareness among MSMEs

Banks/FIs

- ✓ Financial assistance to ESCOs
- ✓ PRGF to mitigate the risk of investment of ESCO

ICAI

- ✓ Creating awareness among Motor manufacturer / supplier / integrator to participate in project





Key financial indicators

Particulars	Unit	Value
Number of motors (baseline study completed)	Nos	454
Average cost per motor	Rs.	37,885
Total project cost	Rs.	17,199,790

Particulars	Unit	Value
Project implementation period	Months	30
Estimated time for installation of motors	Months	12
Recovery period after installation (EMIs)	Months	18
Average EMI (per motor)	Rs./month	2472

Return on Investment (ROI) for ESCO – 10.2%

Thank You

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and
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