Technology demonstration and dissemination approach to achieve GHG reduction among SMEs

Energy Efficiency Training Week for India

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Focus of the presentation

- Different levels (L 1, 2, 3) of energy efficiency improvement in industry
- Types of EE technologies: pre-commercial/semi-commercial and commercial technologies
- Different approaches to achieve energy savings/CO2 reduction among SMEs
  - Deep dive approach
  - RDD&D (Research, Development, Demonstration & Diffusion) approach

Why energy efficiency

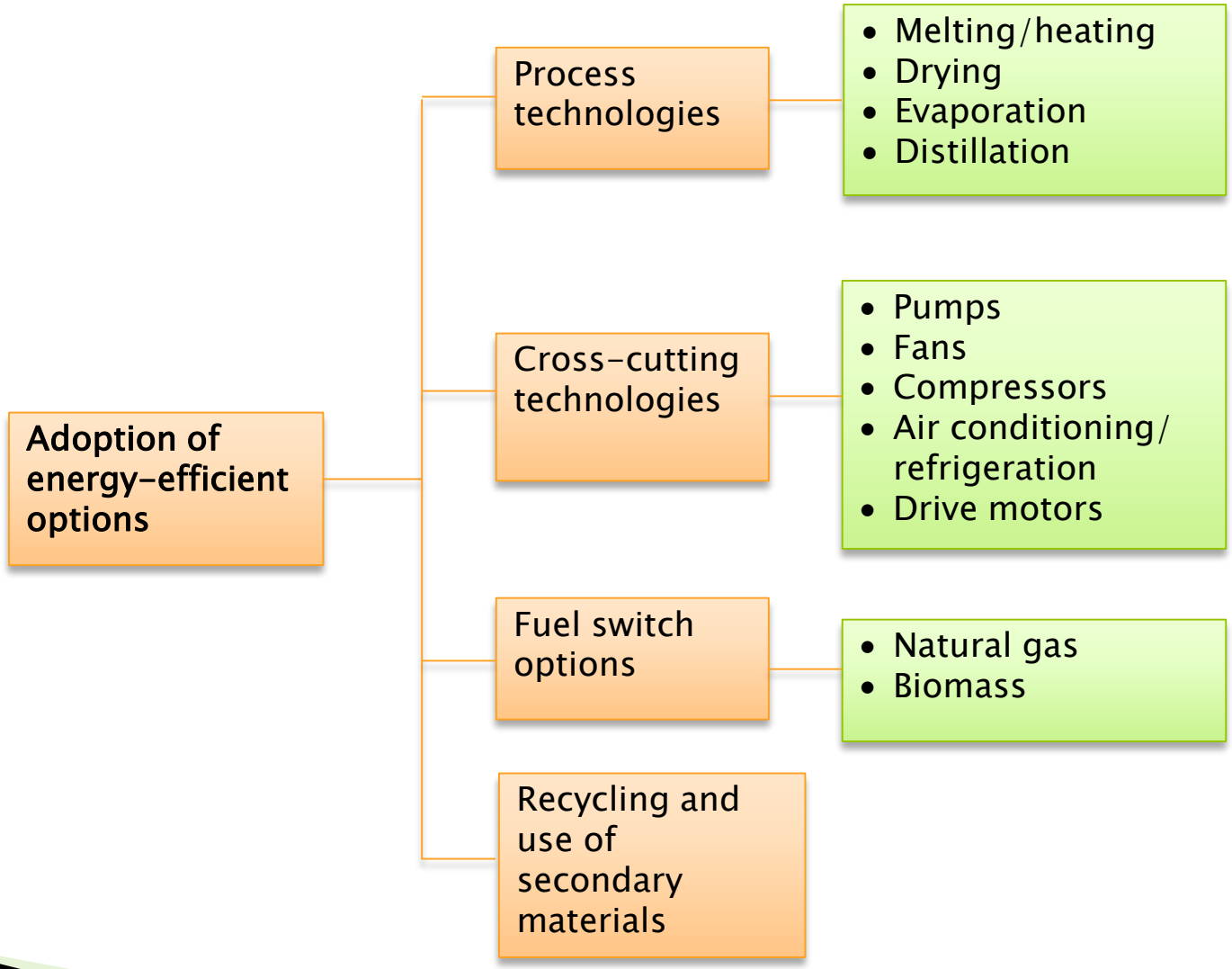
- Improving energy efficiency is the cheapest and most effective means to mitigating climate change
- According to the IEA, improving energy efficiency must account for more than 50% of the measures needed to win the battle against global warming

Energy efficiency is the cheapest

- Energy efficiency improvements required capital investment or manpower or both

- Payback period $= \dfrac{\text{Capital required}}{\text{Annual savings}}$

Option	Payback period
Solar	7 years
Wind power	10 years
Energy efficient technologies	< 2 years


Adoption of energy-efficient options
Process technologies
Melting/heating
Drying
Evaporation
Distillation
Cross-cutting technologies
Pumps
Fans
Compressors
Air conditioning/ refrigeration
Drive motors
Fuel switch options
Natural gas
Biomass
Recycling and use of secondary materials

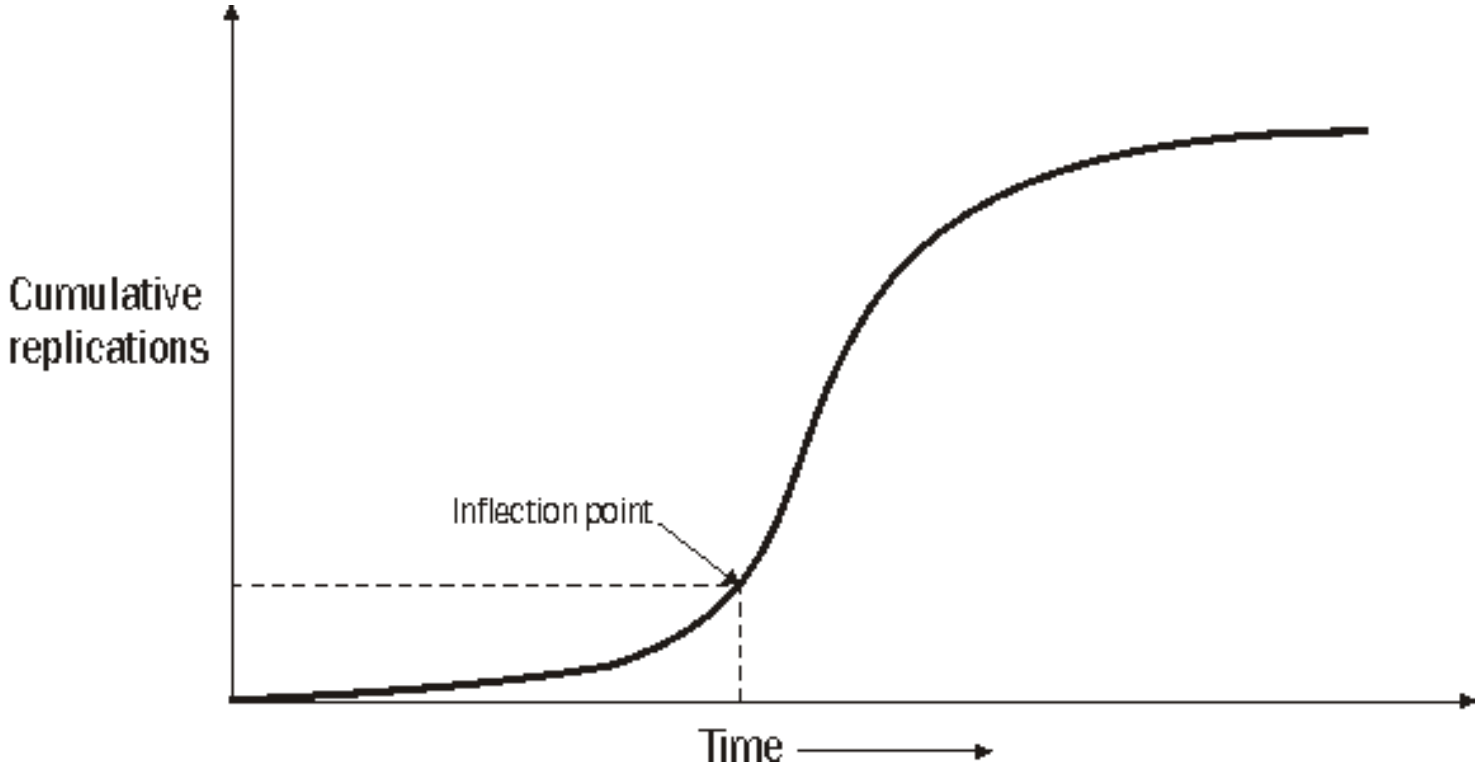
Characteristics of SMEs in India

- Individually small in size but large in number
- Geographically clustered
- Use low efficiency conventional technologies which have remained unchanged for decades
- Little R&D efforts
  - Underdeveloped support institutions and local service providers
  - Limited capacity to innovate

Approaches to improve energy efficiency

- Training/awareness creation
- Energy audits and implementation support for EE technologies and practices
- Technology demonstration
- Policies (financial concessions, regulation etc)

EE technologies are at different stages



EE technologies are at different stages

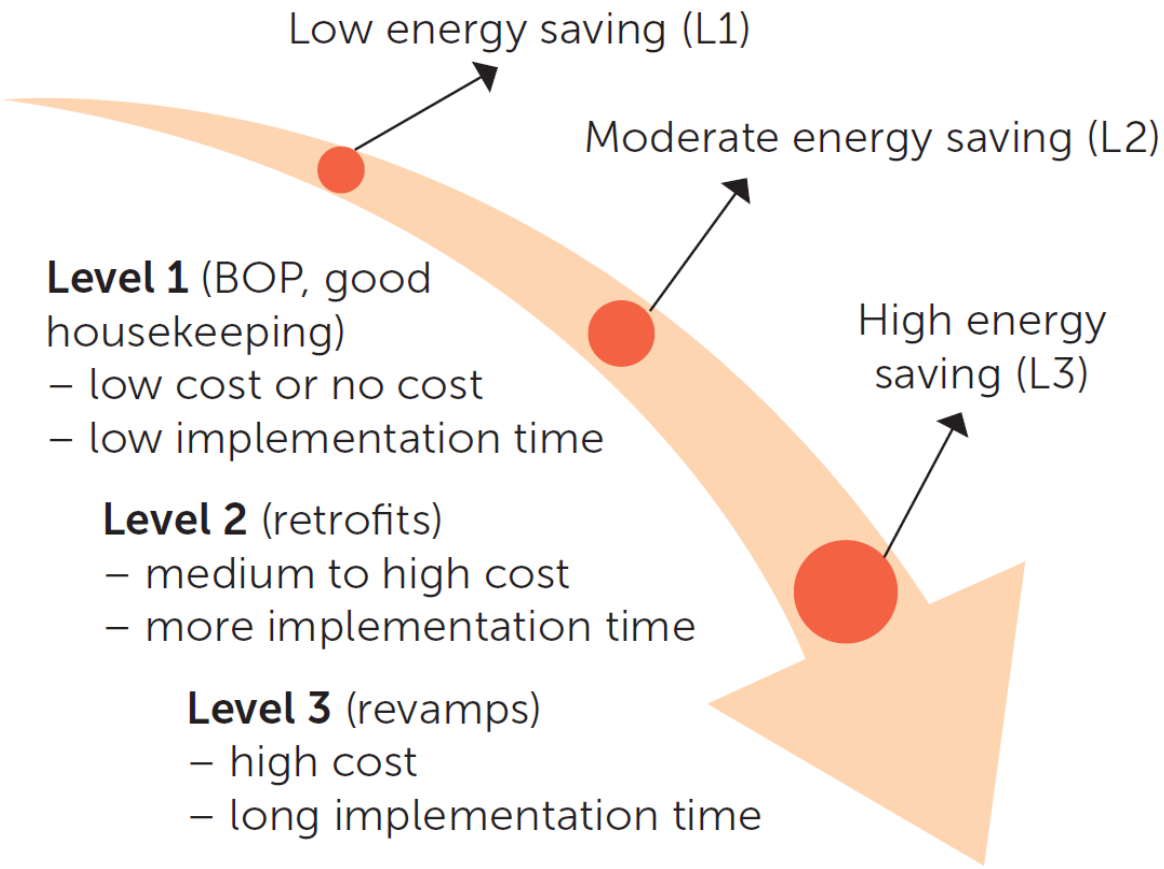
Commercial y available technologies

- Already available in the market, but yet to be widely replicated
- Slower adoption either either due to low awareness or higher cost
- Awareness generation, energy audits and implementation support and concessional finance will help

Deep dive approach at cluster level

- A cluster level intervention aimed at detailed energy audits and technical assistance during implementation
- The approach helps to capitalising on energy efficiency improvements at different levels within an industry

Energy savings at different levels



Energy savings at L1

Energy inefficient operating practice: large sized raw materials charged into induction furnaces

Energy savings at L2

Lid mechanism installed for induction furnace

Energy savings at L3

Replacing reciprocating air compressor (L) with VFD-based screw air compressor (R)

Actual results from a deep dive intervention in a SME cluster

- Cluster: Rajkot Foundry Cluster (Gujarat)
- Period: 3 years (2015-17)
- No. of units covered: 110

- Strategy
- Project office established. Vendors were identified and recommended

- Results
- All 110 units fully or partly implemented EE recommendations
- Total of 757 EE recommendations implemented
- Annual energy savings 1,409 toe or CO2 reductions of 12,700 tonnes achieved

Pre-commercial/ Semi-commercial technologies

- Technology not available off-the-shelf/too expensive
- Technology demonstration (blackbox approach) OR Technological capacity building through Research, Development, Demonstration and Dissemination (RDD&D approach)

Technology Demonstration

- Electric Heat Pump (EHP), a EE technology which results in 30-40% energy savings
- Useful to preheating of boiler feed water and precooling of process chilled water
- Dairy, food processing, pharmaceutical, commercial buildings
- Pilot plants installed in 2 dairies in India
- Energy savings 30-40%

Technological capacity building

RDD&D – creating the ripples

Designing of a RDD&D initiative on Energy Efficient (EE) technologies

- Identify an energy intensive process/sector
- Collaborate with experts (both international and local) to develop/modify (R&D) a cleaner technology as per local needs for the sector
- Demonstrate technologies as per local needs
- Disseminate the demonstrated technology by building local capacities of service providers/users

Background

- Glass making is very energy intensive – energy accounts for 40% of manufacturing cost
- Considerable potential to reduce energy consumption and carbon emissions by adoption of energy efficient furnaces

Approach

- Involved international and local experts to develop (conduct R&D) on:
  - Better furnace construction
  - Burner design
  - Recuperator design
- Demonstrated the energy efficient furnace in one SME

Energy savings of 30-35% demonstrated

Conventional coal/NG fired Pot Furnace

Recuperative Natural Gas fired Pot Furnace

Disseminate

- Local service providers provided training
- Deployment
  - 86 units have adopted the new technology; about 90% of the cluster
  - Cumulative energy savings of 100,000 toe and CO2 savings of 300,000 tones

Thank you for your attention