

Sustainable Energy Efficient Technologies for Improved Energy Performance in MSMEs

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About IIEC

The International Institute for Energy Conservation (IIEC) was established in the USA in 1984 as a non-governmental, not-for-profit organization and has regional offices in **India, the Philippines, and Thailand**. IIEC’s mission is to accelerate the global adoption of energy efficiency and renewable energy policies, technologies, and practices to enable economic and environmentally sustainable development.

Project Experience in more than 40 Countries around the World



Service Areas



GEF-6 Project: Creating and Sustaining Markets for Energy Efficiency



To reduce Green House Gas (GHG) emissions through energy efficiency through scaling up and new technology applications

- **Implementing Agencies:**
 - Asian Development Bank (ADB) - *EERF Support*
 - The United Nations Environment Program (UNEP) - *TA Grant -Soft Component*
- **Executing Agency:** Energy Efficiency Services Limited (EESL)
- **Technical Co-Executing Agency:** International Institute for Energy Conservation (IIEC) - *Since Jan 2024*

- **Component 1:** Expanding and Sustaining investments in existing market sectors
- **Component 2:** Building Market Diversification
- **Component 3:** Replication & Scaling Up

Key Technologies Covered



Energy Efficient Appliances

- LED Lighting: Domestic & Street Lights
- EE Cooling: Ceiling Fans, Air Conditioners

Industrial Energy Efficiency

- Higher Efficiency Motors (IE3/ IE4)
- Heat Pumps
- Waste Heat Recovery Solutions
- Industrial Automation
- Compressors, Blower, Pumps

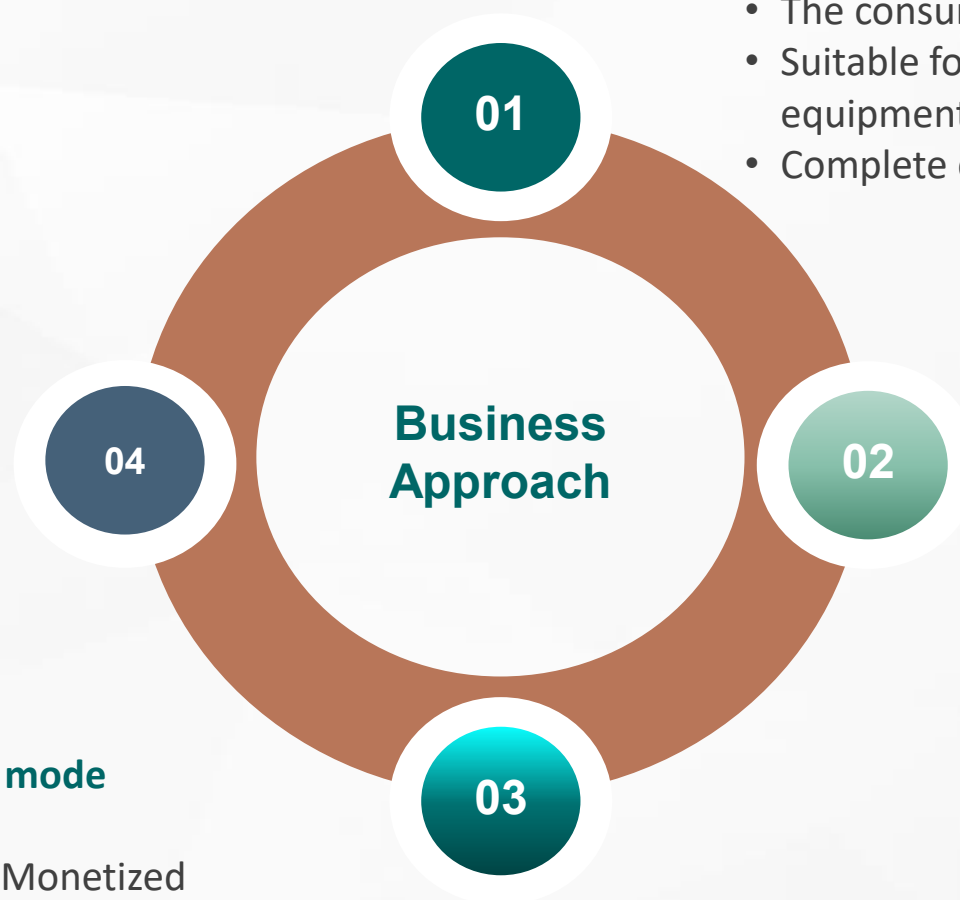
Business Approach

Interest Subvention

- Technical Assistance provided by EESL-BEE
- Financed by the FIs at lower RoI under Govt. scheme

Shared Savings/ ESCO mode

- Investment by ESCO
- Repayment through Monetized Savings



Upfront Payment Model (BAU)

- The consumer/ client to pay entire cost upfront
- Suitable for smaller ticket size appliances/ equipment
- Complete confidence w.r.t Energy Savings

On Bill Financing

- Utility based DSM model
- Active participation by Private Sector Utilities
- Eg. – UJALA scheme, Fans, Electric Cooktops

Business Model



PMC MODEL (*Upfront Investment done by Client*)

Inventory Collection

Procurement Facilitation

Extended Warranty

Project Monitoring

Total Project Cost: Motor Cost + EESL PMC Fees

ESCO MODEL (*Upfront Investment done by EESL*)

Inventory Collection

Procurement Facilitation

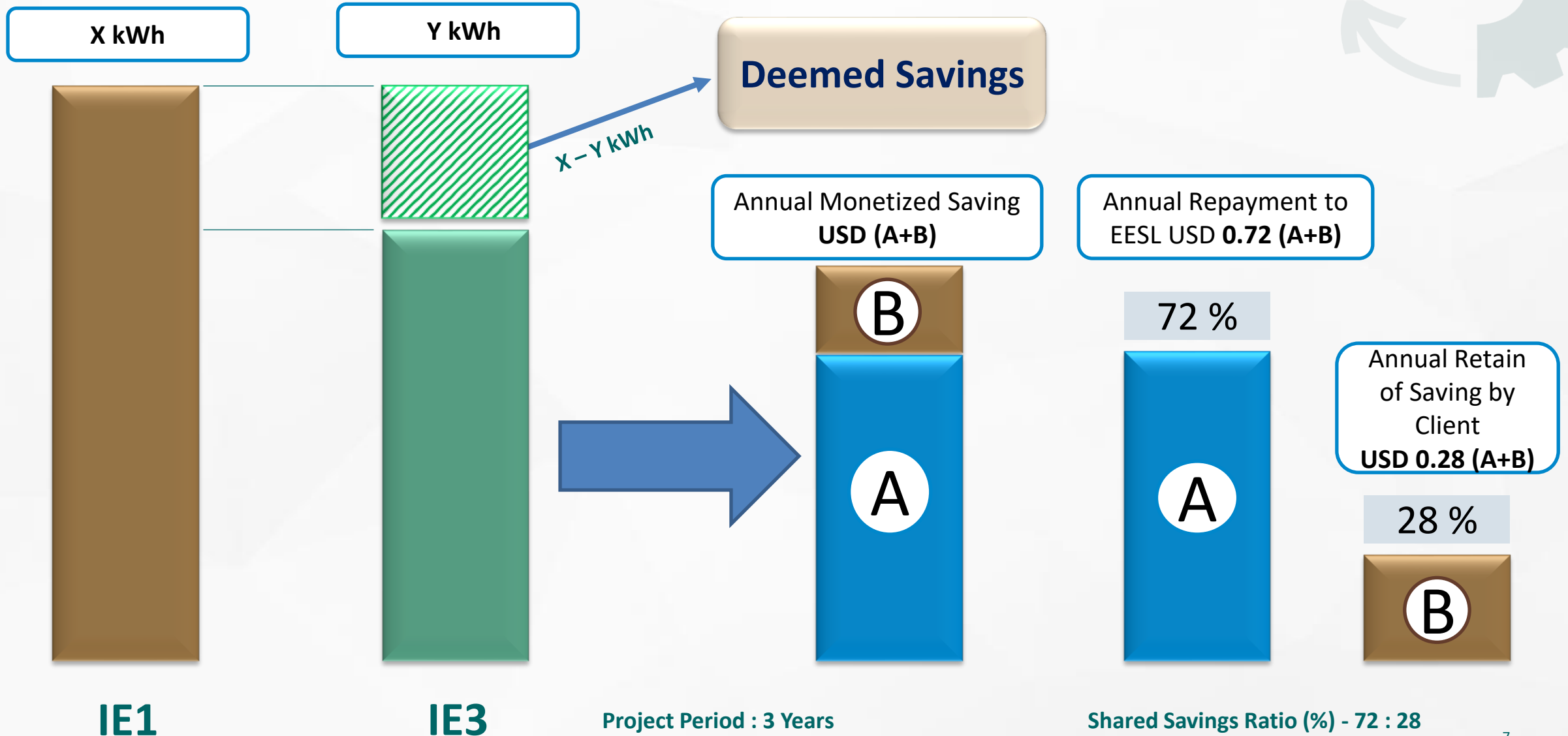
Extended Warranty

Investment by EESL

Project Monitoring

Total Project Cost: Motor Cost + PMC Fees + Financing Cost

Shared Savings Model



Technical Support to MSMEs



Under GEF6 project, IIEC supported MSME units to understand the relevant technology and its implementation in the Secondary Steel and Textiles Sectors

100+ Expressions of Interests (Eoi) received

87+ Baseline Reports prepared

34 Detailed Feasibility Reports

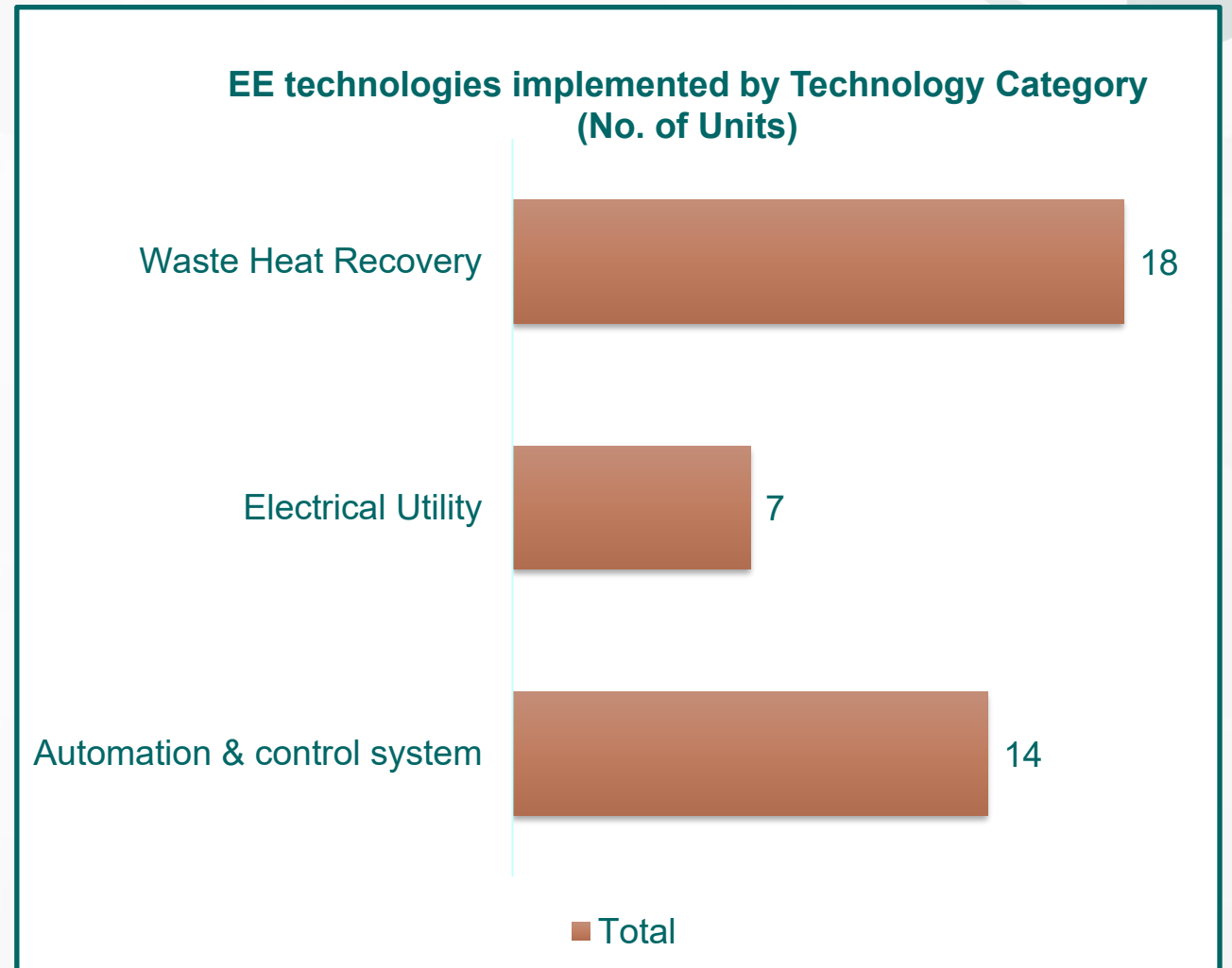
32 Implementations completed

4 Industrial Clusters

Technical Support to MSMEs

Technologies Installed

- ❑ Energy-efficient motors and pumps with VFDs
- ❑ Heat exchanger in the effluent system
- ❑ High-efficiency metallic Recuperator in the reheating furnace
- ❑ IGBT-based electric induction furnace with CCM
- ❑ Ladle preheater diesel to LPG conversion
- ❑ Scrap Bundling Machine with Vibro Feeder
- ❑ Screw Compressor with PM motor and VFD
- ❑ Waste heat recovery system in the boiler
- ❑ Fluidized Bed Combustion (FBC) boiler fired with a combustion air preheating system
- ❑ Automation and Control System in Re-heating Furnace



Project Impact

Technology Category	EE/RE technologies implementations (No. of Units)	Annual Monetary Savings (million USD)	Reduction in Energy Consumption (toe/y)	Annual GHG Emission Reduction (tCO2)	Investments (million USD)
Waste Heat Recovery Solutions	18	1.52	8432.63	43115	0.74
Automation & control Systems	14	1.67	10105.66	35609.95	0.44
Electrical Utilities	7	3.84	5430.49	14780.74	1.63
Total		7.03	23968.78	93505.69	2.81



- # Market Transformation

- ## Environment

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Program Evaluation: Challenges



- ❑ High Upfront Cost → Financing
- ❑ Technology Awareness and Confidence → Feasibility Studies & Dissemination
- ❑ Performance Guarantee → Energy Savings Insurance
- ❑ Assured Savings → MRV

Program Evaluation: Benefits



Direct Benefits

- ✓ Lower Energy Consumption through the installation of Energy Efficient Street lighting (SL), domestic LED lights (DL), 5 Star ceiling fans and Air Conditioners and agricultural pumps
- ✓ Improved performance and productivity through IE3/ IE4 motors and motor driven systems
- ✓ Lower Operating Costs, Better Resource Utilization, GHG emission abatement through deployment of low carbon technologies (WHRS, Heat Pumps, Screw Compressors etc.)

Indirect Benefits

- ✓ Enhanced System Reliability
- ✓ Enhance technical and institutional capacity
- ✓ Improved livelihood
- ✓ Greater Energy Security
- ✓ Reduced Environmental Impact towards Net Zero

THANK YOU

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