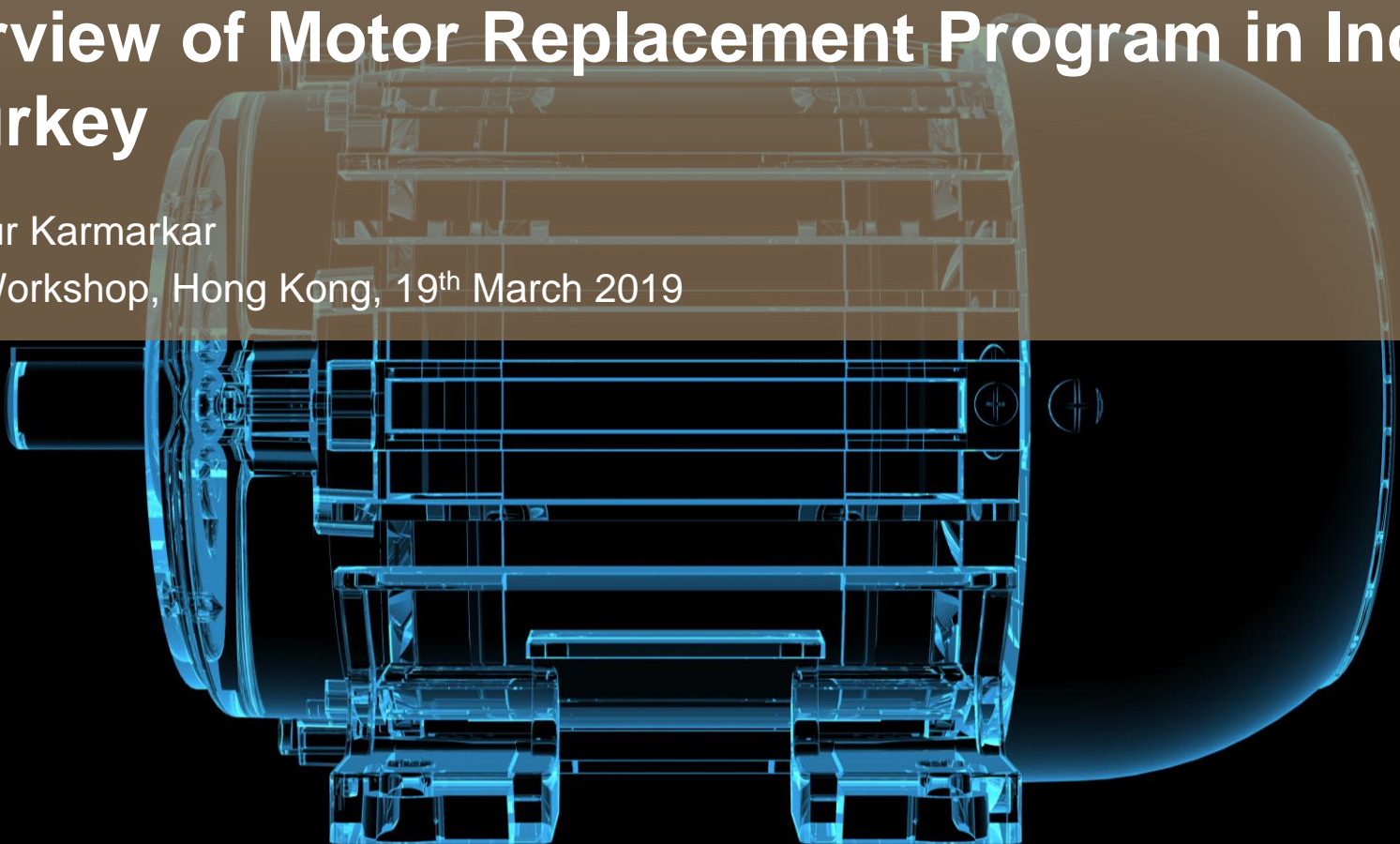




International Copper
Association
Copper Alliance

Overview of Motor Replacement Program in India & Turkey

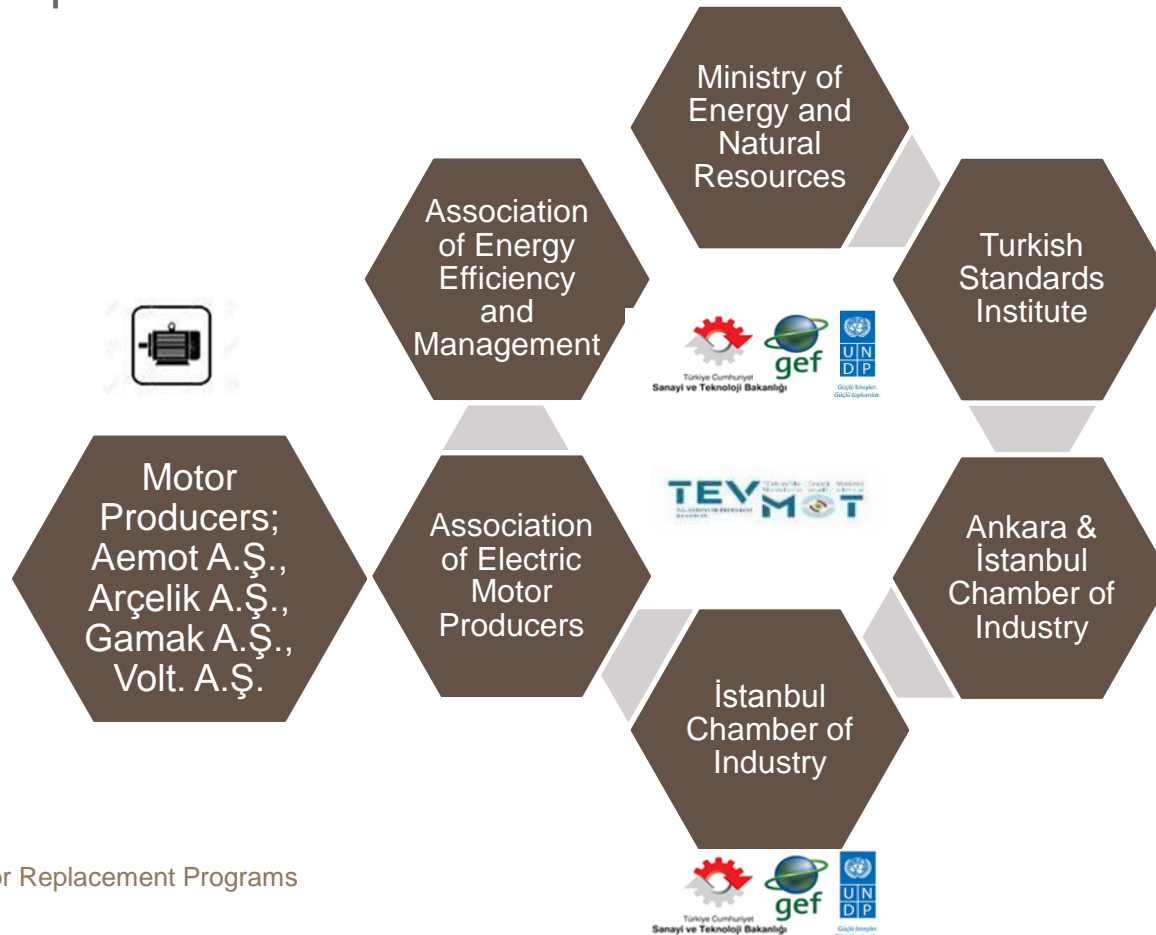
By Mayur Karmarkar
APEC Workshop, Hong Kong, 19th March 2019



-
- Promoting Energy-Efficient Motors in Small and Medium Sized Enterprises Project “TEVMOT”
 - EESL’s National Motor Replacement Program in India

Promoting Energy-Efficient Motors in Small and Medium Sized Enterprises Project “TEVMOT”

- Promoting Energy-Efficient Motors in Small and Medium Sized Enterprises



United for Efficiency And TEVMOT

Cu

- TEVMOT Project is in cooperation with U4E initiative, also will help developing finance mechanisms to accelerate market transformation of energy efficient motors in Small and Medium Enterprises (SMEs).
- TEVMOT Project will share its future achievements and outputs with other EE projects in the world initiated by U4E (child projects).



Güçlü bireyler.
Güçlü toplumlar.

TEVMOT Project Objective

Cu

The Project aims to promote significant additional investment in industrial energy efficiency in Turkey by transforming the market for energy efficient motors used in small and medium sized enterprises

Displacement of existing inefficient motors with efficient ones in SMEs



Start to exchange

Maintaining new efficient motors' penetration into the market



Local Import



Transform the market for EE motors



TEVMOT
Türkiye'deki Enerji Verimliliği
Motorlarına Dönüşüm Projesi

Project Quantitative Targets

Cu

2017 – 2022

5 Years of Project
Implementation Term

Solid success result of
TEVMOT Project
addresses around 40
thousands of electric
motor replacement.

This figure refers to
around **USD 35 million.**

1,048,604 Ton direct CO₂eq
Sera Gas (GHG) emission
decrease

~ 1 million ton
CO₂ eq decrease

1,520,377 MWh direct
electricity energy saving

~ 1,5 million
MWh saving

37,861 pieces of replaced
inefficient motors with
efficient ones.

[Assumption: average motor
power 42,5 kW, working hours 5,5
hrs/day, %78 loaded]

~ 40 thousands
of motor
replacement

Energy Efficiency Potential in Electric Motors in Turkey

Cu

Approximately 72% of the annual electricity consumed in our country's industry is caused by AC motors of 7.5 kW and above.



3-Phase Asynchronous Squirrel Cage AC Electric Motor



Energy Efficiency Potential in Electric Motors in Turkey

Cu

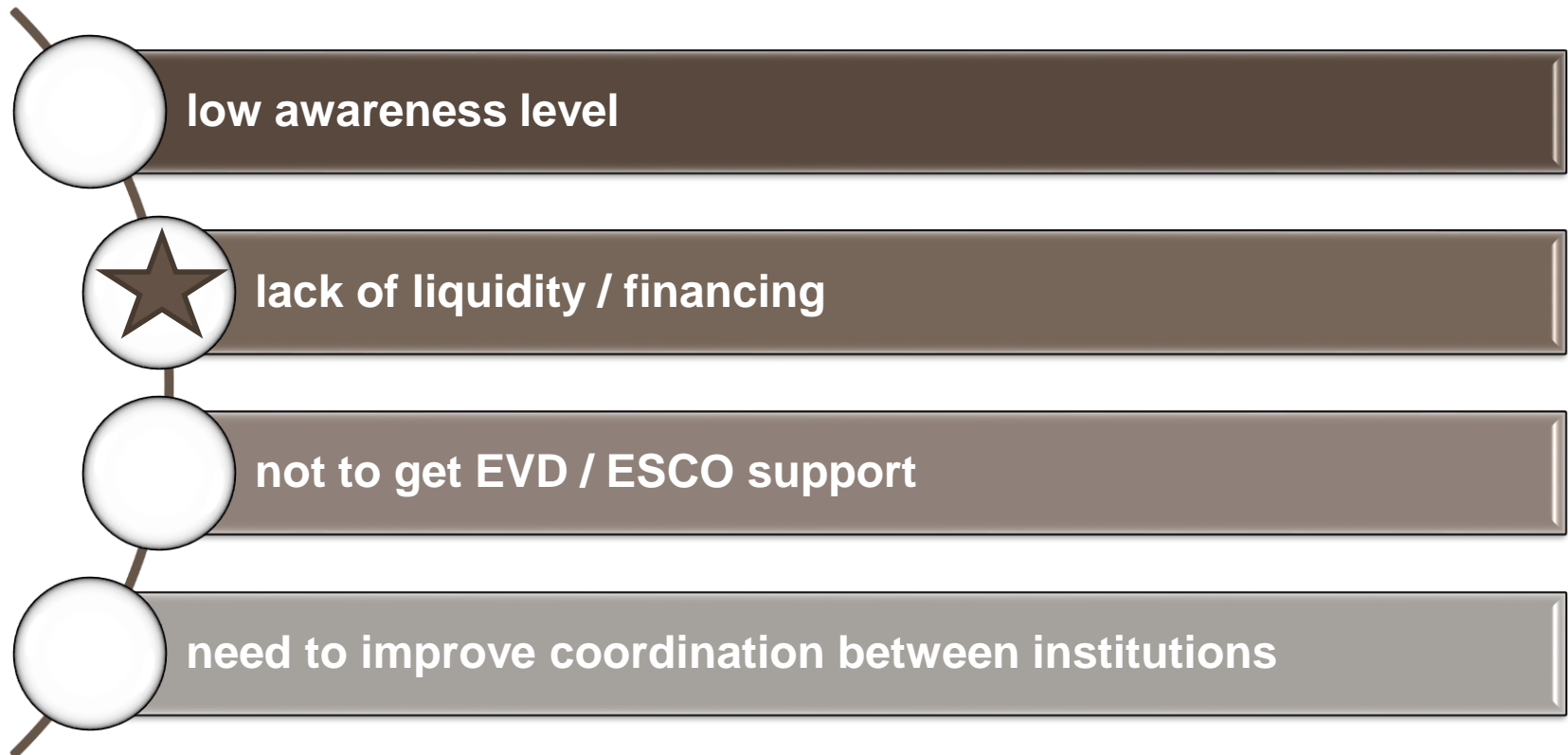
As inefficient (IE0, IE1, IE2 without Variable Speed Drive) qualifying total of **3,783,694** units of 7.5 kW and above powered AC motor.

Replacement of all of these inefficient motors
34 billion kWh of electricity savings.

Approximately **8.5 billion TL** contribution to the national economy per year.

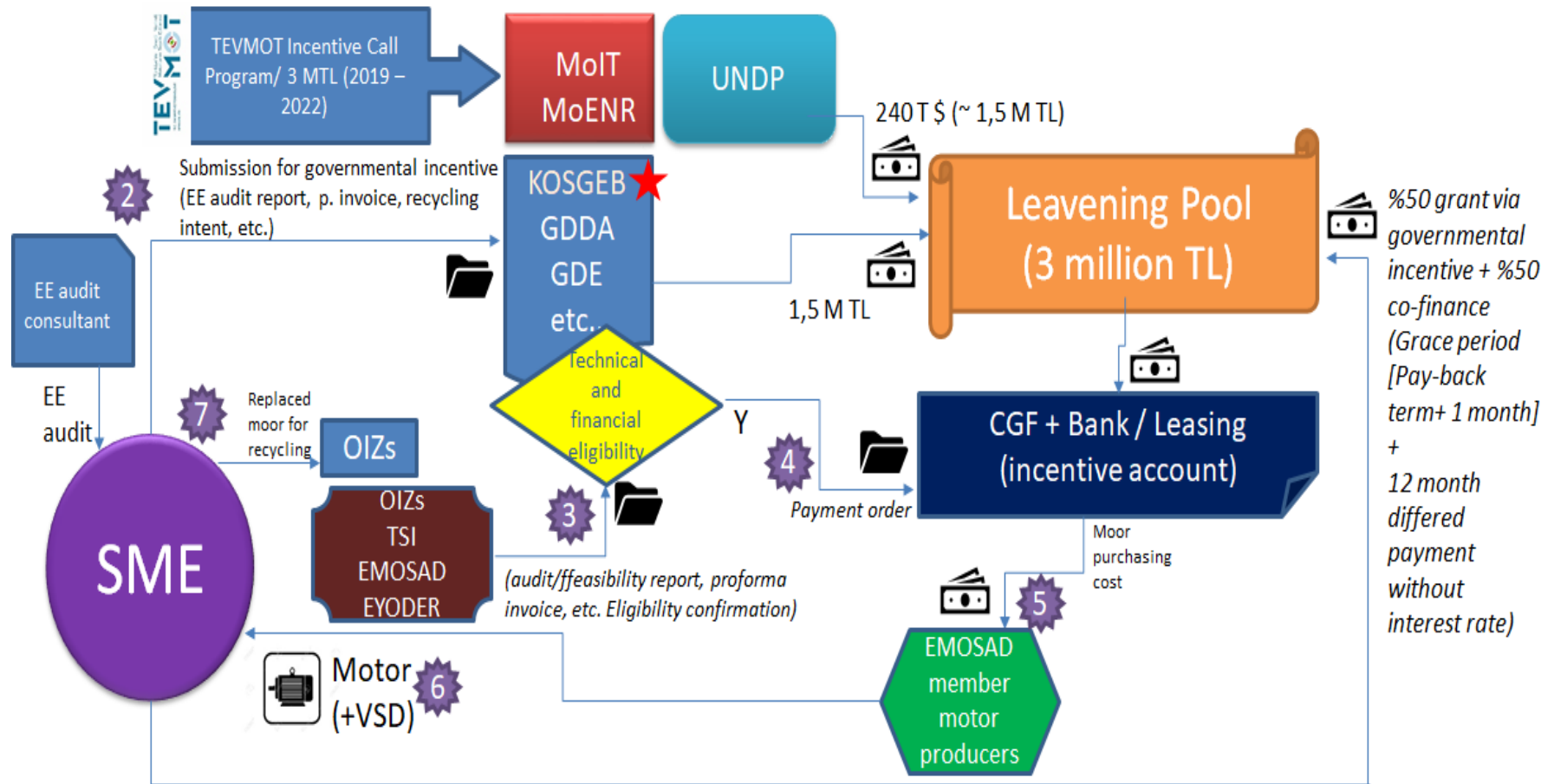
Primary Barriers Towards Expanding Energy-Efficient Electric Motor in Turkey

Cu



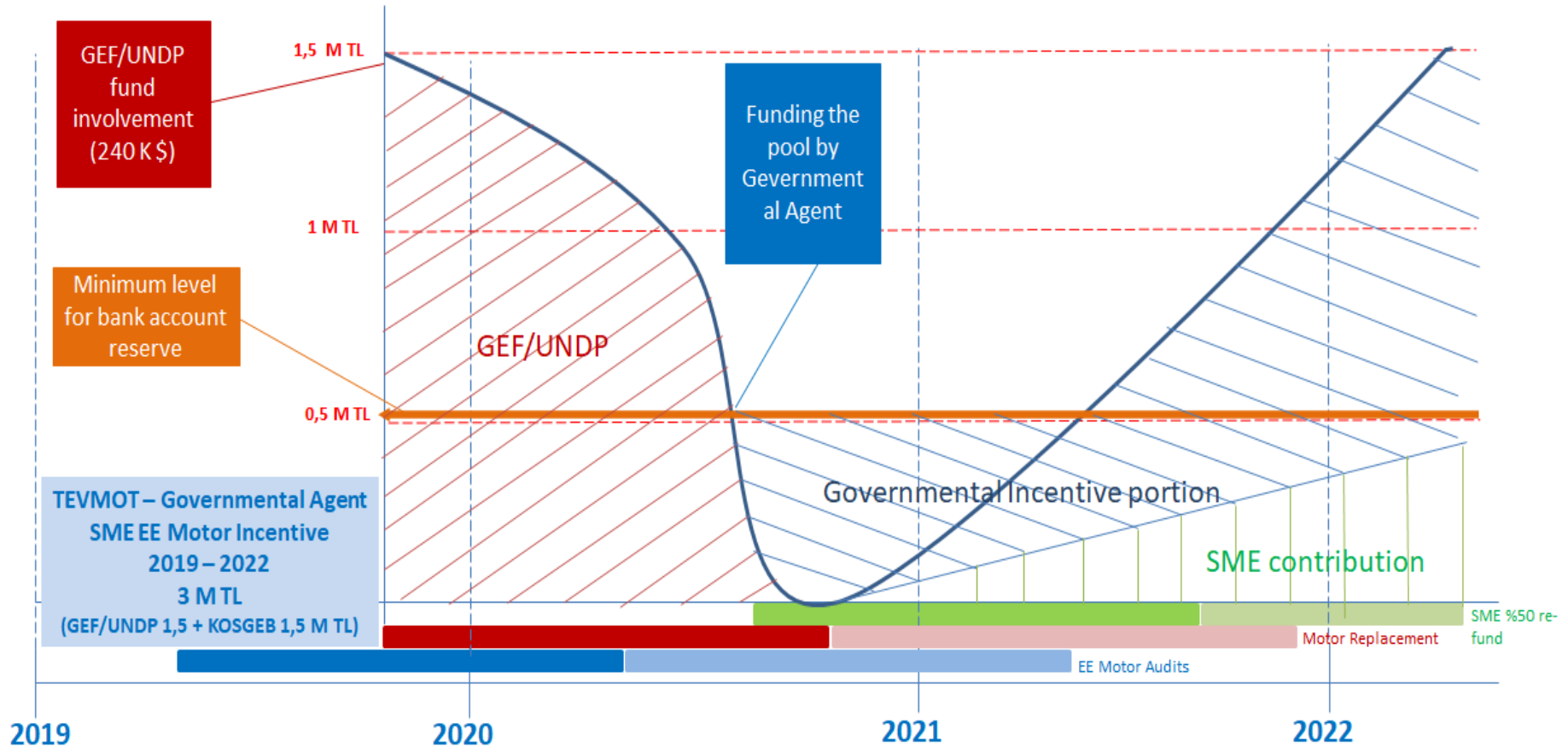
TEVMOT Concept for Accessing to Finance

Cu



Incentive Program Bank Account Possible Flow

Cu



India - EESL's National Motor Replacement Program

Energy Efficiency Services Limited (EESL)

Cu

EESL is a joint venture company of four Public Sector Enterprises of Ministry of Power, Govt. of India



NTPC Limited (India's Largest Power Generating Company | Market Cap as on 1st March 2016 – US \$15.5 billion)

Rural Electrification Corporation Limited (Market Cap as on 1st March 2016 – US \$2.4 billion)

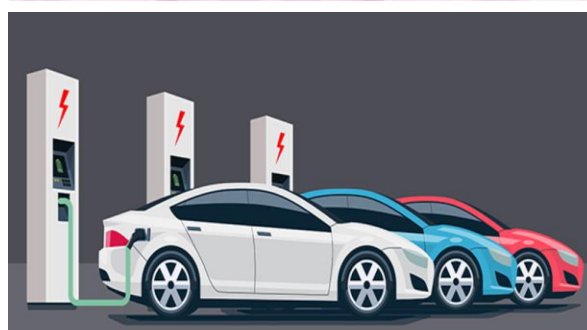
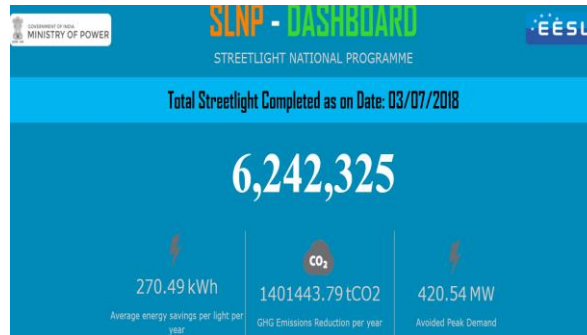
Power Finance Corporation Limited (Market Cap as on 1st March 2016 – US \$3.1 billion)

Power Grid Corporation of India Limited (India's Largest Power Transmission Company | Market Cap as on 1st March 2016 – US \$10.7 billion)

- A public Energy Service Company (ESCO) under Ministry of Power
- Established in the year 2009
- 100% share holding with Public Sector Enterprises
- Board of Directors represented by Ministry of Power and Bureau of Energy Efficiency (BEE)

Few Programs of EESL

Cu



About National Motor Replacement Program

Cu

Potential for Nation Savings

- Over 2 Million motors produced in India pa.
- Annual energy saving potential of more than 5 billion kWh or USD 500 Million PA.
- Avoided power generation capacity 600 MW.

Objective

- Accelerate motor replacement with IE3 motors by addressing the financial barrier
- Aims to replace 1,20,000 motors in the first phase and address the following issues to replace with energy efficient motors.
 - 90% of installed stock of motors is IE1 and sub-IE1 levels resulting huge inefficiency.
 - Old & rewind motors over the years running more than 15 years

Program Key Features

Cu



No upfront investment by the customer



Repayment through monetised energy savings



IE-3 motors for lesser price compared to present market price.



Extended warranty



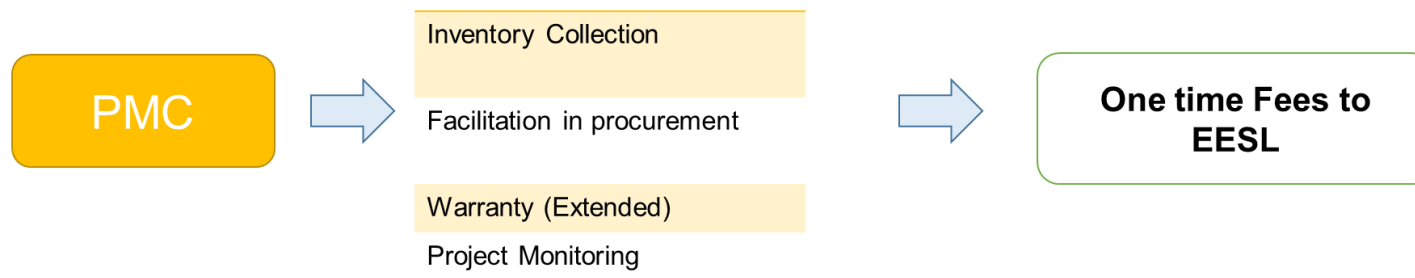
Value addition support for; motor load survey

Program Details

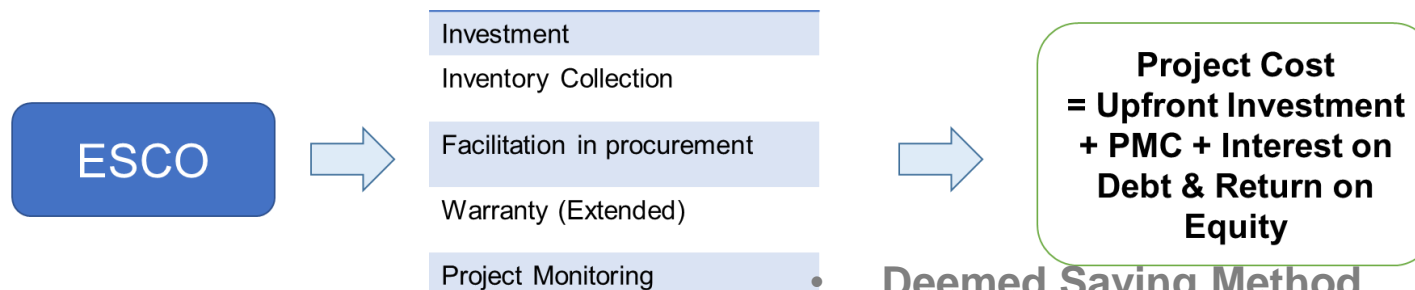
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Program Administrator	EESL
Target Group	Large, Medium Industries & commercial establishments
Project Duration	3 years
Procurement of IE3 motors	By EESL , Open bidding process as per defined technical specifications
Warranty	3 years
Supply & Installation	Supply by EESL, Installation by customer
Number of motors in 1 st Phase	120,000 IE 3 motors
Ratings in 1 st Phase	1.1kW, 1.5kW, 2.2kW, 3.7kW, 5.5kW, 7.5kW, 11kW, 15kW, 22kW – 4 Pole, Foot Mounted
Program management & customer interface	Web portal
Disposal of old motors	By customer

- **Model 1:-** If 100% investment is made by customer,



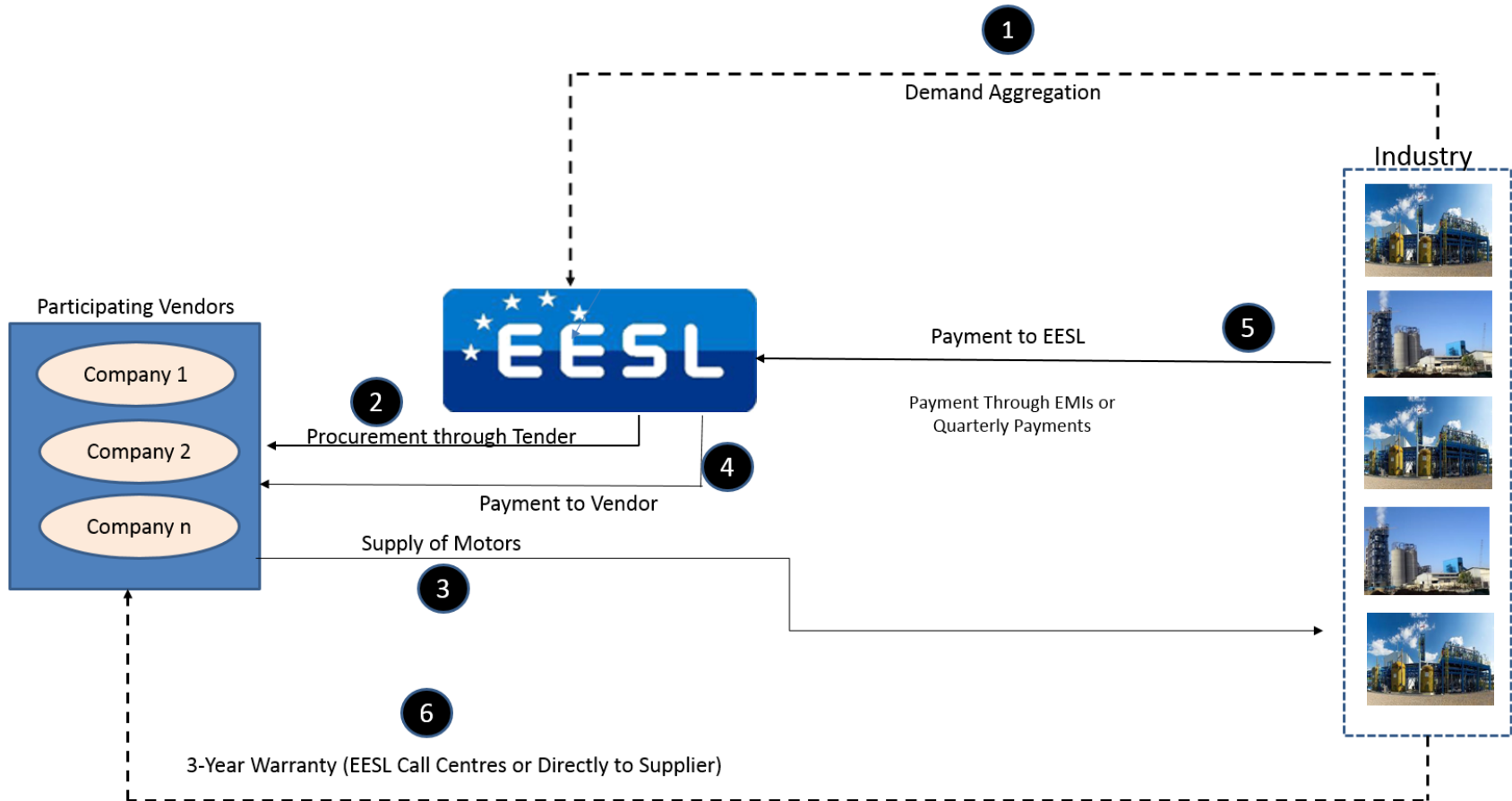
- **Model 2:-** If 100% Investment by EESL



Deemed Saving Method
Repay EESL through instalments over 3 years from monetised energy savings

Operation Model

Cu



Self Financing Project - Illustration

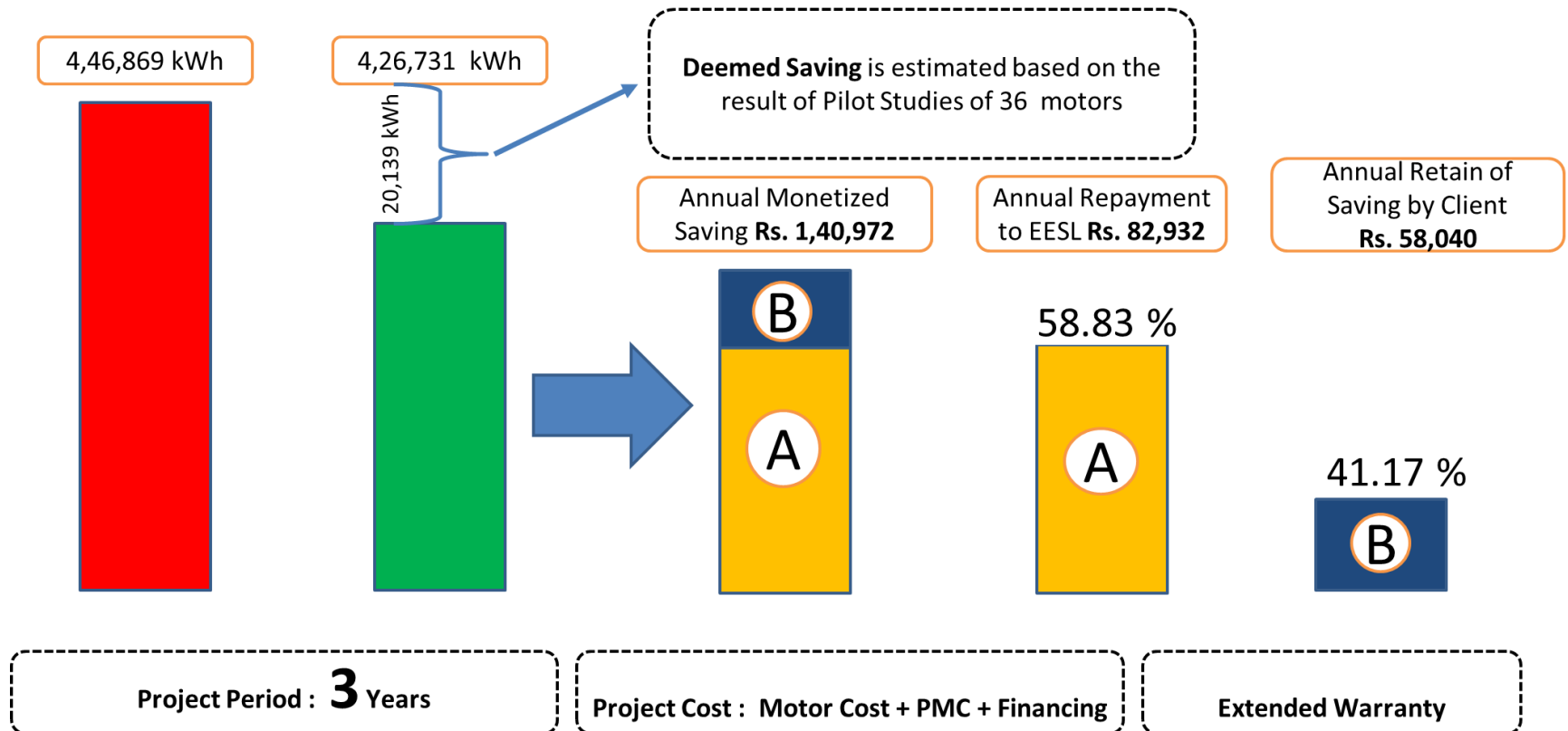
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S. No.	Particular(s)	Unit	Value
1	Total Quantity of Motor(s) across ratings	No.	9
2	Estimated Energy Savings	kWh per annum	20,139
3	Grid Power Cost	Rs. per kWh	7.00
4	Energy Savings per Annum	Rs. per annum	1,40,972
5	Capital Cost of Motor(s) (including transportation)	Rs.	1,55,179
6	EESL PMC @ 10%	Rs.	15,518
7	Capital Cost of Motor(s) (including transportation and EESL PMC)	Rs.	1,70,697
8	Estimated Total Project Cost	Rs.	1,70,697
9	Equity Portion (20% of SN 8)	Rs	34,139
10	Return on equity (15.5% post tax)	Rs	14,524
11	Debt Portion (80% of SN 8)	Rs	1,36,558
12	Interest on Debt (11%)	Rs	25,622
13	Total Cost	Rs	2,10,843
14	GST @ 18%	Rs	37,952
15	Total Project Cost Including GST	Rs	2,48,795
16	Contract Period	Years	3.00
17	Annual Repayment to EESL Annually	Rs	82,932
18	% Share of cost savings to EESL	%	58.83
19	Quarterly Repayment to EESL	Rs	20,733
20	Number of Quarters	Nos	12.00

25% Lower than Market Price





Repay EESL from Energy Savings

Cu



Program Benefits

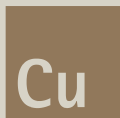
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	CUSTOMER	<ul style="list-style-type: none">• Use of superior quality product• Less price - low payback period• Supporting the National Energy Efficiency Program
	MOTOR MANUFACTURERS	<ul style="list-style-type: none">• Single order with large volume• Brand building• Supporting the National Energy Efficiency Program
	GOVERNMENT & UTILITIES	<ul style="list-style-type: none">• Reduced peak demand• Create market transformation for energy efficient product• Support DSM program
	ECONOMY	<ul style="list-style-type: none">• Energy saving-hence lower fossil fuel consumption• Creating employment opportunities• Meeting climate change goals

nt Programs

Thank you

For more information please contact
mayur.karmarkar@copperalliance.asia



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Association**
Copper Alliance

**Copper.
Makes the World Work Better.**