Monitoring report form for CDM programme of activities
(Version 02.0)

MONITORING REPORT		
Title of the PoA	CFL lighting scheme – "Bachat Lamp Yojana"	
UNFCCC reference number of the PoA	PoA 3223	
Version numbers of the PoA-DD applicable to this monitoring report	09	
Version number of this monitoring report	02	
Completion date of this monitoring report	28/03/2018	
Monitoring period number	Fifth Monitoring Period	
Duration of this monitoring period	01/01/2016 to 28/04/2017 (both days inclusive)	
Monitoring report number for this monitoring period	Batch 1	
Coordinating/managing entity	Bureau of Energy Efficiency	
Host Parties	Host Party of the PoA	Is this the host Party of a CPA covered in this monitoring report? (yes/no)
	India	Yes
Sectoral scopes	Sectoral Scope 3 : Energy demand	
Applied methodologies and standardized baselines	Applied Methodology: AMS-II.J. , Version 03	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by all CPAs covered in this monitoring report in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0 tCO_2e	29,201 tCO_2e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the CPA-DDs for the CPAs covered in this monitoring report	42,034 tCO_2e	

PART I Monitoring of programme of activities (PoA)

SECTION A. Description of PoA

A.1. General description of PoA

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The purpose of the Bachat Lamp Yojana (BLY) project activity is to replace the conventional incandescent lamps (ICLs) by compact fluorescent lamps (CFLs) in the residential grid connected households. Under the BLY scheme, up to four, long-life quality CFLs[1] were distributed to grid-connected residential households in exchange of one ICL and INR 15 for one CFL. The reduction in total power demand through the energy saving achieved has resulted a reduction of greenhouse gases (GHG) emissions that would otherwise being emitted during production of the equivalent amount of power in grid connected mostly fossil fuel based power plants.

In CFLs, the electrical current from the ballast flows through the gas, causing it to emit ultraviolet radiations. The phosphor coating converts the ultraviolet radiation emitted to visible light spectrum. CFLs are much more energy efficient than baseline ICLs. The efficiency of ballast-integrated CFL typically ranges from 51 to 56 lumen/ Watt, which is 4 to 5 times higher than an equivalent ICL. Consequently, CFLs consume only 1/4th to 1/5th of the energy used by baseline ICLs to provide the same level of light output.

The 11W, 14W, 18W and 20W CFLs were distributed to households in exchange of equal number of normal luminous flux 60W and 100W ICLs, respectively. These CFLs have the equivalent or higher lumen to the replaced ICL (620lm and 1240lm, respectively) and a rated lifetime of 10.000 hours. These are also high power factor CFLs and they can withstand wide voltage fluctuations. Table 3 below provides the rated normal lumen output for the ICL as per IS 418:2004, as used in this project.

Table 3: Technical Specifications of CFLs used in Project

Baseline ICL Replaced (Watt)	Rated Normal Lumen Output (IS418:2004)	CFL range (Watt)
60	620 or more	11/14
100	1240 or more	18/20

The distribution of CFLs and replacement of previously used ICLs in households in the CPA area was using one or more of the following methods:

- direct installation at each household; and/or
- ICL collection and CFL distribution through dedicated distribution points as advertised by the CPA owner in the local media e.g. local DISCOM offices, retail outlets, resident association offices, schools etc.

The implementation chronology is presented in section B.1 of this monitoring report.

The implementation of the CPAs (under this PoA) covering this monitoring period has resulted in achieving 29,201 tonnes of CO_2 equivalent of greenhouse gas emission reductions.

A.1.1. Corresponding generic component project activities (CPAs)

Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Sectoral scopes	Applied methodologies and standardized baselines
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Sectoral Scope 3 : Energy demand	AMS-II.J. "Demand-side activities for efficient lighting technologies" (Version 3.0) "Tool to calculate the emission factor for an electricity system" (Version 1.1)

[1] In India IS 15111 standard specifies a minimum 6000 hours rated life time. Long life quality CFLs in BLY context thus meet IS 15111 requirements and have an average rated life of 6000 hours and above.

A.1.2. CPAs included in the PoA

Title and UNFCCC reference number of the CPA	Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Crediting period type and duration	Covered in this monitoring report? (yes/no)
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 29/05/2011 – 27/03/2019 (both days inclusive)	yes
CFL lighting scheme – "Bachat Lamp Yojana" in Thiruvananthapuram Urban Circle of Kerala State Electricity Board, Kerala, India; 3223-0002	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 01/05/2011 – 10/03/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Thiruvananthapuram Rural Circle of Kerala State Electricity Board, Kerala, India; 3223-0003	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 10/03/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Pathanamthitta Circle of Kerala State Electricity Board, Kerala, India; 3223-0004	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 25/03/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kottayam Circle of Kerala State Electricity Board, Kerala, India; 3223-0005	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 25/03/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kottarakkara Circle of Kerala State Electricity Board, Kerala, India; 3223-0006	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 10/03/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kollam Circle of Kerala State Electricity Board, Kerala, India; 3223-0007	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 10/03/2015 (Including both days)	no

CFL lighting scheme – "Bachat Lamp Yojana" in Palakkad Circle of Kerala State Electricity Board, Kerala, India; 3223-0008	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Shornur Circle of Kerala State Electricity Board, Kerala, India; 3223-0009	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Tirur Circle of Kerala State Electricity Board, Kerala, India; 3223-0010	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Manjeri Circle of Kerala State Electricity Board, Kerala, India; 3223-0011	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kannur and Kalpetta Circles of Kerala State Electricity Board, Kerala, India; 3223-0012	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kozhikode Circle of Kerala State Electricity Board, Kerala, India; 3223-0013	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Vadakara Circle of Kerala State Electricity Board, Kerala, India; 3223-0014	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 18/11/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kasargod and Sreekandpuram Circles of Kerala State Electricity Board, Kerala, India; 3223-0015	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh	09	Renewable 09/05/2011 – 18/11/2015	no

	Limited, Andhra Pradesh, India; 3223-0001, version 9		(Including both days)	
CFL lighting scheme – "Bachat Lamp Yojana" in Thrissur Circle of Kerala State Electricity Board, Kerala, India; 3223-0016	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 12/04/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Ernakulam Circle of Kerala State Electricity Board, Kerala, India; 3223-0017	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 12/04/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Irinjalakkuda Circle of Kerala State Electricity Board, Kerala, India; 3223-0018	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 12/04/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Pala & Thodupuzha Circles of Kerala State Electricity Board, Kerala, India; 3223-0019	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 12/04/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Perumbavoor Circle of Kerala State Electricity Board, Kerala, India; 3223-0020	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 12/04/2015 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Allappuzha Circle of Kerala State Electricity Board, Kerala, India; 3223-0021	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 09/05/2011 – 12/04/2015 (Including both days)	no
"Bachat Lamp Yojana" in KOLAR DISTRICT, ELECTRICAL DIVISION OF KOLAR CIRCLE, KGF DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0022	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 01/07/2011 – 29/04/2019 (Including both days)	no
"Bachat Lamp Yojana" in CHIKKABALLAPURA DISTRICT, ELECTRICAL DIVISION OF	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division,	09	Renewable 31/08/2011 –	no

KOLAR CIRCLE, CHIKKABALLAPURA (CB PURA) DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0023	Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9		29/06/2019 (Including both days)	
"Bachat Lamp Yojana" in BANGALORE RURAL DISTRICT, ELECTRICAL DIVISION OF BANGALORE RURAL CIRCLE, CHANDAPURA DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0024	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 31/08/2011 – 29/06/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in KOLAR DISTRICT, ELECTRICAL DIVISION OF KOLAR CIRCLE, KOLAR DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0025	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 31/08/2011 – 29/06/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in BANGALORE RURAL DISTRICT, ELECTRICAL DIVISION OF BANGALORE RURAL CIRCLE, NELAMANGALA DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0026	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 19/08/2011 – 17/06/2019 (Including both days)	no
"Bachat Lamp Yojana" in RAMANAGARA DISTRICT, ELECTRICAL DIVISION OF BANGALORE RURAL CIRCLE, RAMANAGARA DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0027	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 31/08/2011 – 29/06/2019 (Including both days)	no
"Bachat Lamp Yojana" in BANGALORE RURAL DISTRICT, ELECTRICAL DIVISION OF BANGALORE RURAL CIRCLE, YELAHANKA DIVISION, BESCOM, KARNATAKA, INDIA; 3223-0028	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 01/07/2011 – 29/04/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Shalimar Bagh District of North West Circle and Model Town District of North Circle, North Delhi Power Limited, Delhi, India ; 3223-0029	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 10/04/2012 – 09/04/2022 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Keshav Puram, Civil Lines and Shakti Nagar Districts of North Circle, North Delhi Power Limited, Delhi, India; 3223-0030	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 15/03/2012 – 14/03/2022 (Including both days)	no

CFL lighting scheme – "Bachat Lamp Yojana" in Pitampura District of North Circle, Rohini District of Northwest Circle, North Delhi Power Limited, Delhi, India ; 3223-0031	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 07/07/2012 – 06/07/2022 (Including both days)	no
Bachat Lamp Yojana" in Moti Nagar District of North Circle, Mangol Puri District of Northwest Circle, North Delhi Power Limited, Delhi, India; 3223-0032	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 06/01/2012 – 05/01/2022 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Bawana District, Badli District and Narela District of North West Circle, North Delhi Power Limited, Delhi, India; 3223-0033	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 15/11/2011 – 14/11/2021 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in NORTH GOA, ADMINISTRATIVE DIVISIONS OF BLOCK-II, GOA ELECTRICITY DEPARTMENT, GOA, INDIA; 3223-0034	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 30/10/2011 – 28/08/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in South Goa, Administrative Divisions of Block- I, Goa Electricity Department, Goa , India; 3223-0035	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 30/10/2011 – 28/08/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Industrial, City Center, Hakima Gate and Civil Line Divisions of Amritsar City Circle and East and West Divisions of Amritsar Sub Urban Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0036	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 03/03/2012 – 30/12/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Kartarpur Division of Kapurthala Circle and Model Town, East and West Divisions of Jalandhar Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0037	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 04/05/2012 – 01/03/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Rayya and City Tarn Taran Divisions of Tarn Taran Circle and Sub Urban, Jindal guru and Ajnala	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution	09	Renewable 27/10/2012 – 24/08/2020	no

Divisions of Amritsar Sub Urban Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0038	Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9		(Including both days)	
CFL lighting scheme – "Bachat Lamp Yojana" in Sub Tarn Taran, Patti and Bhikiwind Divisions of Tarn Taran Circle and City Kapurthala and Sub Urban Kapurthala Divisions of Kapurthala Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0039	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 22/11/2012 – 19/09/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in City Nakodar and Sub Urban Nakodar Divisions of Kapurthala Circle and Phagwara and Cantt. Divisions of Jalandhar Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0040	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 31/03/2012 – 27/01/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Mohali, Zirakpur and Lalru Divisions of Mohali Circle and Kharar Division of Ropar Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0041	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 14/08/2012 – 11/06/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in City Ferozpur, Sub-urban Ferozpur, Jalalabaad and Zira Divisions of Ferozpur Circle and Fazilka Division of Muktsar Circle, Punjab State Power Corporation Limited, Punjab, India; 3223-0042	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 31/03/2012 – 27/01/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Gachibowli Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0043	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 25/07/2012 – 22/05/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Kukatpally Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0044	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 20/04/2012 – 16/02/2020 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Medchal Division,	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division,	09	Renewable 09/10/2012 –	no

Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0045	Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9		06/08/2020 (Including both days)	
CFL lighting scheme – "Bachat Lamp Yojana" in Hyderabad District, Hyderabad South Circle, Asmangadh and Charminar Divisions, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0046	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 29/03/2012 – 28/03/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Hyderabad District, Hyderabad Central Circle and Hyderabad North Circle with underlying Azamabad and Green Lands Divisions respectively , Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0047	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 29/03/2012 – 28/03/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Hyderabad District, Hyderabad North Circle,Bowenpally and Paradise Divisions, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0048	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 23/12/2012 – 22/12/2022 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy South Circle and Ranga Reddy East Circle with underlying Champapet and Saroornagar Divisions respectively, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0049	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 29/03/2012 – 28/03/2019 (Including both days)	no
CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy South Circle, Vikarabad and Rajendra Nagar Divisions, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0050	CFL lighting scheme – "Bachat Lamp Yojana" in Ranga Reddy District, Ranga Reddy North Circle, Habsiguda Division, Central Power Distribution Company of Andhra Pradesh Limited, Andhra Pradesh, India; 3223-0001, version 9	09	Renewable 08/08/2012 – 07/08/2022 (Including both days)	no

A.2. Coordinating/managing entity

>>

Bureau of Energy Efficiency

SECTION B. Implementation of PoA

B.1. Description of implemented PoA

>>
The Bureau of Energy Efficiency, India is the BLY PoA managing entity. Under this PoA, three different entities viz. C- Quest Capital Malaysia Limited (CQC), Energy Management Centre, Department of Power, Government of Kerala (EMC), and HPL Electric & Power Pvt. Limited (HPL) have included fifty (50) CPAs as of end date of the present monitoring period. This monitoring report comprises only 1 CPA that is included and implemented by C- Quest Capital Malaysia Limited (CQC). C- Quest Capital Malaysia Limited (CQC) has distributed the CFLs to the households under CPAs, prepared the monitoring reports and hired the third party for ex-post monitoring surveys. Sampling plan is implemented separately for each specific-case CPA.

B.2. Post-registration changes to PoA

B.2.1. Corrections

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B.2.2. Inclusion of monitoring plan

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B.2.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

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B.2.4. Changes to programme design

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PART II Monitoring of CPAs

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SECTION C. Implementation of CPAs

C.1. Description of implemented CPAs

>>

Under this PoA, three different entities viz. C- Quest Capital Malaysia Limited (CQC), Energy Management Centre, Department of Power, Government of Kerala (EMC), and HPL Electric & Power Pvt. Limited (HPL) have included fifty (50) CPAs as of end date of the present monitoring period. Out of fifty CPAs, twenty nine (29) CPAs implemented by the implementer Energy Management Centre, Kerala & HPL Electric & Power Pvt. Limited and twenty (20) CPAs implemented by C- Quest Capital Malaysia Limited (CQC), are not part of this monitoring report. This monitoring report comprises only one(1) CPA that is included and implemented by C- Quest Capital Malaysia Limited (CQC). The monitoring report is prepared and submitted as per the "version 01.0 of CDM project standard for programmes of activities"; EB 93 guideline, which allows parties under a PoA to submit multiple monitoring reports for the same monitoring period. Any CPA included in this monitoring report will not be part of another monitoring report comprising other forty nine CPAs implemented by Energy Management Centre, Kerala, HPL Electric & Power Pvt. Limited and C- Quest Capital Malaysia

Limited (CQC). The information of CPA 3223-0001 (included in this monitoring report) distributed in Telangana (previously Andhra Pradesh) state of India is mentioned below in the table:

CPAs	**State**	**CME**	**DISCOM**	**Implementer**
3223-0001	Telangana (previously Andhra Pradesh)	Bureau of Energy Efficiency (BEE)	APCPDCL (Central Power Distribution Company of Andhra Pradesh Limited)	C- Quest Capital Malaysia Limited (CQC)

Individual project activity involved installation of self-ballasted CFLs to replace existing ICLs used in the household. The electronic ballast integrated in the CFL is a non-removable part. The table below shows the lumen output and rated lifetime of the CFLs installed in the individual project activity against the replaced ICLs. The project CFLs meet or exceed the rated normal lumen output of the replaced ICL.

	ICL (baseline)	CFL (project)	ICL (baseline)	CFL (project)
Wattage (W)	60	11/14	100	18/20
Lumen output (lm)	620*	620**	1.240*	1.240**
Rated Lifetime (hours)	1.000	10.000	1.000	10.000

*Rated normal Lumen output for 60 W and 100 W of ICLs as per IS 418:2004.

** Rated normal Lumen output for 11/14 W and 18/20 W CFLs as per IS 15111:2002 (Part 2)

The project CFLs are in compliance with Indian Standard IS 15111:2002, which is the national standard for self-ballasted compact CFLs. The specifications of the project CFLs are as below:

a) Self-ballasted type

b) Rated lifetime of 10.000 hours

c) Embossed or laser printed with project logo for clear unique identification

d) BC/B22 base

e) Power factor of greater than 0.85

f) Lumen output of 620 or more for 11 and 14 W CFL and Lumen output of 1240 or more for 18 and 20 W CFL

The implementation of the project activity involves the distribution of up to four (4) long life quality CFLs per household to the grid connected residential households of the CPA area. One CFL is distributed in exchange of one ICL and INR 15. SSC-CPA 3223-0001 which approaches registration under BLY PoA is assigned a unique code by the PoA managing entity viz. BEE (001-CQC-AP).The CPA specific implementation chronology is presented as follows:

UNFCCC Ref No	**3223-0001**
Dates of CFL distribution	11/05/2011 - 09/10/2011
Date of destruction of ICLs	21/10/2011
Dates of 1st ex-post Monitoring survey	23/12/2011 - 06/01/2012
Dates of 1st MP (Batch 1)	30/05/2010 - 31/12/2012
Date of issuance of 1st MP (Batch 1)	25/07/2014
Dates of 2nd MP (Batch 1)	01/01/2013 - 31/10/2013
Date of issuance of 2nd MP (Batch 1)	11/05/2015
Dates of 2nd ex-post Monitoring survey	15/12/2014 – 17/12/2014
Dates of 3rd MP (Batch 1)	01/11/2013 – 31/12/2014
Date of issuance of 3rd MP (Batch 1)	23/10/2015

Dates of 4th MP (Batch 1)	01/01/2015 – 31/12/2015
Date of issuance of 4th MP (Batch 1)	20/11/2017

The DISCOM (Distribution Company) maintains a database of domestic users identifiable on the basis of a unique connection number and/or address used for billing purposes. The distribution activities were carried out by first accessing this consumer database of the grid connected residential consumers from the CPA area.

The potential recipient households were educated to install the CFL in high-usage areas, such as outsides, common areas, living room area and kitchen to maximize the energy savings. The distribution of CFLs and replacement of previously used ICLs in households in the CPA area was done using one or more of the following methods:

- Direct installation at each household; and/or
- Dedicated distribution points as advertised by the CPA investor in the local media e.g. local DISCOM offices, retail outlets, resident association offices, schools etc.

However, for the CPA included in this monitoring report, the distribution of CFLs was done through dedicated distribution points as advertised by CPA implementer and respective DISOCMs.

After the completion of CFL installation stage, the collected ICLs were stored in separate boxes according to the wattage and clearly labelled as per their contents. These ICL boxes were transferred to centrally designated ICL storage facilities. Further arrangement was made with ICL destruction agency to collect ICLs from these centrally designated storage facilities (collection points) for the destruction of ICLs in safe manner.

CPA implementers have hired various destruction agencies like Indian Pollution Control Association (IPCA), Eco Birdd Recycling and Global E-waste Management & Services (GEMS) for destruction of ICLs collected. The copies of the agreements are shared with the verifying DOE for verification. Information related to the of ICL destruction activities and the quantity of ICLs destructed are as follows:

UNFCCC Ref. No.	Date of destruction of ICLs	ICL Destruction Ageny	No of ICLs collected & destroyed of each wattage type "i" ($N_{Destroyed}$)	
			$N_{Destroyed,60}$	$N_{Destroyed,100}$
3223-0001	21/10/2011	GEMS	140,515	290,732

The “Certificate of Destruction” released by the agency mentioning the quantities of ICLs collected and destroyed on 21/10/2011 is also shared with the verifying DOE.

Double counting can occur if a registered CDM project activity or a CPA of another PoA is sought to be registered under the BLY PoA. To prevent such instances, the BEE had adopted a two-stage check:

- At time of implementer(s) empanelment, SSC-CPA implementer credentials are verified
- At time of CPA eligibility check, BEE seeks confirmation in SSC-CPA and also checks any-double counting using DISCOM, UNFCCC data.

To prevent double counting the CFLs utilized under the BLY scheme, in addition to the standard lamp specifications, was marked for clear unique identification logo for the BLY project.

The total GHG emission reductions achieved in this monitoring period for Batch 1 is 29,201 tCO_2 equivalents. Net energy savings in this monitoring period for the specific-case CPA is 34,114 MWh.

C.2. Location of CPAs

>>
The political/geographical boundary of India is the PoA boundary.

The country latitude of 22º 00' N and longitude of 77º 00' E. (referred from http://www.mapsofworld.com/lat_long/india-lat-long.html).

The geographical location of the CPA included under this PoA is as follows:

UNFCCC Ref. No.	DISCOM	District	Division	Latitude	Longitude
				in decimal degree	in decimal degree
3223-0001	APCPDCL (Central Power Distribution Company of Andhra Pradesh Limited)	Ranga Reddy	Habsiguda	21.125498	81.914063

The unique geographic location of the applied measure (CFLs) in household is determined using the household consumer number provided by utility and/or the household physical address.

C.3. Post-registration changes to CPAs

C.3.1. Temporary deviations from the monitoring plans in the included CPA-DDs, applied methodologies or standardized baselines

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C.3.2. Corrections

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C.3.3. Changes to the start date of the crediting period

>>
Start date of crediting period was changed for the included CPA as follows:

Reference number of the specific-case CPA	Start date of crediting period at the time of CPA inclusion	Revised start date of crediting period	Date of approval from CDM EB
3223-0001	30/05/2010	29/05/2011	09/09/2013

C.3.4. Inclusion of monitoring plan

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C.3.5. Permanent changes to the included monitoring plans, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

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C.3.6. Changes to project design

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SECTION D. Description of monitoring system of CPAs

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The overall monitoring system under all the SSC-CPAs can be summarised in the figure 1 & 2. These two figures outline the key elements of the hierarchy and data monitoring plan for a SSC-CPA, highlighting responsible entities and their tasks, interaction channels among them, and key monitoring parameters.

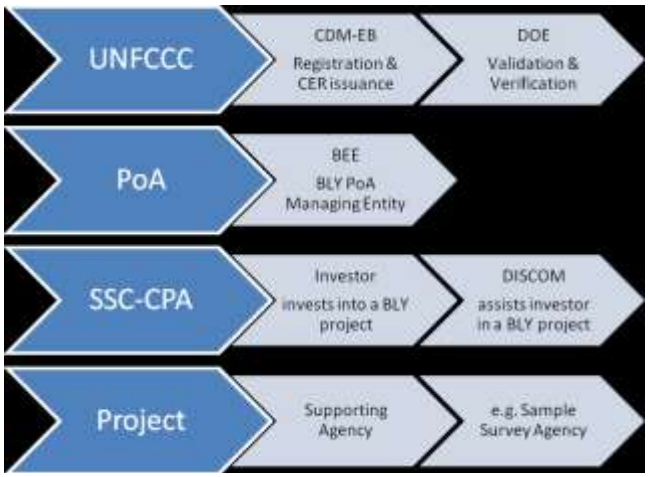

Figure 1: Institutional layers in developing and implementing the BLY scheme

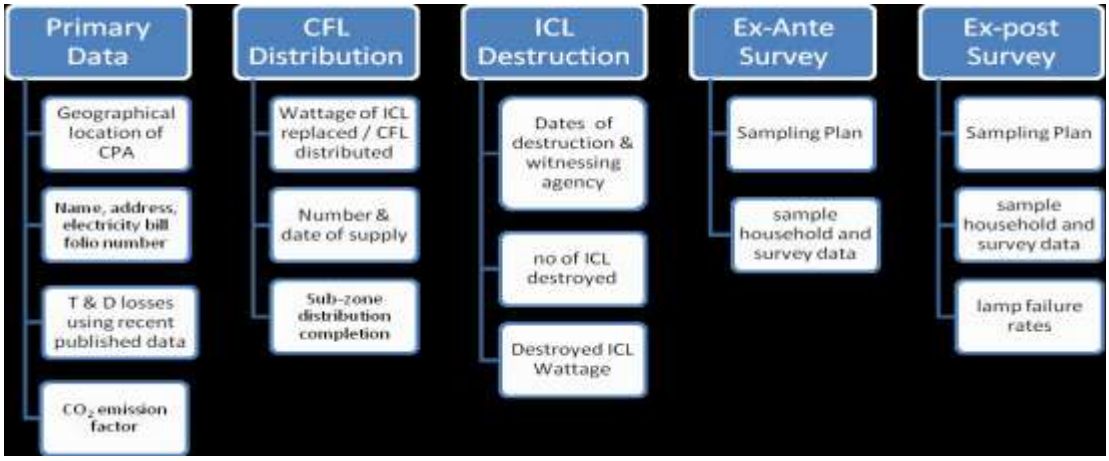

Figure 2: SSC-CPA Database components as per BLY scheme

As per applied methodology AMS–II.J., the monitoring for the SSC-CPAs have been carried out at the following levels:

1.CFL distribution
2.Ex-post Monitoring Survey
3.Baseline ICL destruction
4.CFL Destruction

1.CFL Distribution

The CFLs were distributed by the SSC-CPA owner with support from DISCOM, using one or more of the following methods:

- Direct installation at each household; and/or
- Distribution through dedicated distribution points as advertised by the SSC-CPA owner in the local media e.g. local DISCOM offices, retail outlets, resident association offices, schools etc.

2.Ex-post Monitoring Survey

Random Selection of households

For any proposed SSC-CPA area, the database listing all residential households eligible under the SSC-CPA were randomly selected under the monitoring survey. The sampling is as per following criteria:

Sampling Criteria

1.The survey covered the SSC-CPA area, covering the residential sector only,

2.Random sample group were determined using statistical tools as representing the households falling under the SSC-CPA area. Survey sample size determined to have at-least 90% confidence level with 10 % maximum margin of error[2].

Ex-post Monitoring Survey

In addition to the survey requirements as stated in Annexure 3 of the individual SSC-CPA DD, the following steps were carried out by the third party monitoring survey agency

1. Visited identified households and assess the following for each household:

    a.whether the installed CFLs carry BLY logo or not

    b.whether the installed CFLs are operating or not

The data was collected and collated in the form of a monitoring survey report for each SSC CPA.

3. ICL Destruction

After the completion of CFL installation stage, the collected ICLs were stored in separate boxes according to the wattage and clearly labelled as per their contents. These ICL boxes were transferred to centrally designated ICL storage facilities. Further arrangement was made with ICL destruction agency to collect ICLs from these centrally designated storage facilities (collection points) for the destruction of ICLs in safe manner.

At the beginning of each monitoring interval y, each SSC-CPA verified whether the number of distributed CFLs was less than or equal to the number of returned and destroyed ICLs in the SSC-CPA area.

Following the Random ICL Inspection, all ICLs collected were transported from the collection point to a disposal facility which is qualified and authorized to destroy ICLs (ICL Destruction Facility). Upon arrival at the ICL Destruction Facility, the destruction agency has ensured that there has been no change in the total number of ICLs from that recorded at the Collection Point. After the completion of ICL destruction, waste management company issued a “Certificate of Destruction”.

4. CFL Destruction

Fused CFL was replaced as part of a warranty program for the project, and these replacement CFLs installed in households prior to the monitoring survey was counted as operating. There was no replacement as part of the survey process. The replaced and fused CFLs were recorded in the project database.

During the course of this program, CQC has collected defective CFLs from time to time from consumers. These defective CFLs were stored in warehouse till these are transferred for safe disposal. As part of the contracts with CFL manufacturers, some of the defective CFLs which CQC collected were handed over to the respective manufacturer. One manufacturer has destroyed those CFLs safely and recovered the mercury in a safe manner and provided a declaration on the same. CQC has in the past contacted various registered waste disposal agencies for disposal of its stored defective CFLs. However, in absence of any existing guideline from CPCB on mercury disposal as well as the lack of proper mercury recovery technologies, the CFLs are kept in store and have not been disposed yet. As a continuous effort, CQC is in contact with some

[2] As per AMS-II.J.ver03 methodology

disposal agencies which have now agreed to destroy the CFLs with mercury recovery asserting that they have now the required technology at hand.

The overall supervision is maintained by the BEE as PoA Coordinating and Managing Entity (CME), whereas on-ground implementation takes place by the CPA implementer(s) in association with DISCOM. This is as per the tri-partite agreement in-between BEE, CPA-implementer(s) and the DISCOM operating in the CPA area. The broad overview of monitoring responsibilities envisaged under the CPA is tabulated below.

		Responsibility		
Step	**Description**	**BEE***	**DISCOM**	**SSC-CPA Implementer**
1	Determination of the SSC-CPA area		√	√
2	Establishment of the SSC-CPA implementation plan		√	√
3	Selection of households to be included in the monitoring survey		√	√
4	CFL distribution to the households		√	√
5	Establishment of the SSC-CPA database	√		√
6	Monitoring surveys		√	√
6	Verification of the number of 'destroyed ICLs' and 'distributed CFLs'	√	√	√
7	Reports for estimation of emission reductions	√		√

* Supervisory responsibility.

Household data/CFL distribution data base :

- Project database: A list of households participating in each CPA including name, address, electricity bill folio number, number and wattage of ICL exchanged and CFL distributed, date of distribution and completion of distribution.

- Double counting prevention: Double counting can occur if a registered CDM project activity or a CPA of another PoA is sought to be registered under the BLY PoA. To prevent such instances, the BEE had adopted a two-stage check:

- At time of implementer(s) empanelment, SSC-CPA implementer credentials are verified
- At time of CPA eligibility check, BEE seeks confirmation in SSC-CPA and also checks any-double counting using DISCOM, UNFCCC data.

To prevent double counting the CFLs utilized under the BLY scheme shall, in addition to the standard lamp specifications, was marked for clear unique identification for the BLY project. The logo used was

ICL Destruction data base

The baseline ICLs collected at the time of the CFLs distribution in the CPA area were stored safely in appropriate boxes. The ICL is considered destroyed if it is rendered non-functional. The destruction method(s) followed were:

- Crushing
- Separating ICL shell and cap

The ICLs collected from the households were stored in separate boxes according to the bulb's wattage and labelled clearly of their content. The ICL boxes were then transferred to the waste management company for further destruction. Certificate of destruction was issued upon the destruction of ICLs. The records of the ICL destruction duly verified by the responsible witness are submitted to the CME. These records are maintained by CME under the BLY database.

SECTION E. Data and parameters

E.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{CO2,ELEC,y}$
Unit	tCO_2/MWh
Description	CO_2 emission factor for displacement of electricity in the respective Grid (viz. NEWNE and Southern) serving the household consumers that participate in the SSC-CPA project area during the monitoring interval y, calculated according to the latest approved version of AMS-I.D (tCO_2/MWh)
Source of data	The User Guide of CDM Baseline CO_2 emission database by Central Electricity Authority (CEA), India (versions 4.0), as stated in included CPA-DD.
Value(s) applied	0.856
Choice of data or measurement methods and procedures	The SSC-CPA owner has applied the latest grid emission factor database available on the CEA website at the time of validation and fix the value ex-ante.
Purpose of data/parameter	Emission reduction calculation (Only the emission reduction formula is provided in the methodology)
Additional comments	--

Data/Parameter	O_i
Unit	Hours / day
Description	Average daily operating hours of the baseline ICLs of the group of "*i*",
Source of data	AMS II-J default value
Value(s) applied	3.5 hours per 24 hours period
Choice of data or measurement methods and procedures	The SSC-CPAs have fixed 3.5 hours per 24 hrs period. The value applied has been entered into the SSC-CPA database. AMS II.J version 03
Purpose of data/parameter	Emission reduction calculation (Only the emission reduction formula is provided in the methodology)
Additional comments	The SSC-CPA has used fixed 3.5 hours per 24 hrs period.

Data/Parameter	X_i
Unit	Hours / year
Description	Operating hours per year for CFL type *i*
Source of data	Calculated value
Value(s) applied	1,277.5 hours per 365 day year; 1,281 hours for leap year
Choice of data or measurement methods and procedures	The SSC-CPA has fixed 3.5 hours per 24 hrs period. Hence for the yearly value the estimate is fixed. AMS II.J version 03

Purpose of data/parameter	Emission reduction calculation
Additional comments	The SSC-CPA has used fixed 3.5 hours per 24 hrs period. Hence for the yearly value, the estimate is fixed.

Data/Parameter	NTG
Unit	--
Description	Net-to-gross adjustment factor
Source of data	Default AMS-II.J. value
Value(s) applied	0.95
Choice of data or measurement methods and procedures	AMS II.J version 03
Purpose of data/parameter	Emission reduction calculation
Additional comments	--

Data/Parameter	L_i
Unit	Hours
Description	rated average operating hours for CFL type *i*
Source of data	Life test reports of CFLs
Value(s) applied	10000
Choice of data or measurement methods and procedures	Determined as per the independent life-tests of the CFLs as per national / international standard (refer Annex 4 of PoA-DD).
Purpose of data/parameter	Emission reduction calculation
Additional comments	Determined as per the independent life-tests of the CFLs as per national standard

Data/Parameter	High PF CFL life test report and test curves
Unit	--
Description	Life test reports of CFLs
Source of data	Obtained from accredited manufacturer or laboratory
Value(s) applied	**SSC-CPA** / **UNFCCC Ref No** / **High PF CFL life test reports**: CQC / 3223-0001 / Yes (10,000 hours)
Choice of data or measurement methods and procedures	High PF CFL life test report has been provided to verifying DOE.
Purpose of data/parameter	Emission reduction calculation (Only the emission reduction formula is provided in the methodology)
Additional comments	-

E.2. Data and parameters monitored

Data/Parameter	$Q_{PJ,i}$
Unit	Number
Description	Number of CFLs of the group of "*i*" CFLs (11W, 14W, 18W & 20W CFLs) in operation during the first 12 months of distribution
Measured/calculated/ default	Calculated from survey data

Source of data	First ex post monitoring survey
Value(s) of monitored parameter	Record from project database: 11 W: 140,515 CFLs; 20 W: 290,732 CFLs $Q_{PJ,i}$ obtained from first ex post monitoring survey: 11 W: 136,635 CFLs; 20 W: 280,875 CFLs The difference on the number of CFLs shown above is due to the adjustment made based on the estimate of fraction of operating CFLs obtained in the monitoring survey.
Monitoring equipment	NA
Measuring/reading/recording frequency	Once in the crediting period (within 1 year from end date of distribution of CFLs)
Calculation method (if applicable)	The Q_{pj} value for each type of CFL is calculated from the results of Q_{pj} survey, as follows: •Obtain the ratio of the number lamps of type i with BLY logo found installed & operating in the sample households and the number of lamps of type i claimed to be distributed in the sample households •Multiply the ratio obtained by the total number of lamps of type i claimed to be distributed in the CPA area •The claimed number of lamps is capped by the number of ICLs destroyed. In the first monitoring survey the percentage of 11W & 20W CFLs were found to be 97.24% and 96.61% respectively.
QA/QC procedures	•Monitoring survey was conducted by qualified and experience third party agency •Monitoring survey conducted in accordance with the requirement of methodology so that the estimate of $Q_{PJ,i}$ obtained is unbiased and reliable.
Purpose of data/parameter	Emission reduction calculation (Only the emission reduction formula is provided in the methodology)
Additional comments	-

Data/Parameter	$LFR_{i,y}$
Unit	%
Description	Lamp Failure Rate for CFL type *i* in year *y* (fraction)
Measured/calculated/ default	Calculated based on survey results

Source of data	Ex-post monitoring survey
Value(s) of monitored parameter	LFR_5 = 31.97% & LFR_6 = 38.36% LFR applied in the ER calculation is the *ex ante* LFR which is calculated using the formula provided in methodology.[3] The *ex post* LFR observed from the monitoring survey is lower than calculated *ex ante* LFR. Therefore it is concluded that the project CFLs are operating in accordance with the *ex ante* linear failure rate. To obtain a conservative estimate of emission reductions achieved, *ex-ante* LFR is applied in the calculation.
Monitoring equipment	-
Measuring/reading/recording frequency	*ex post* monitoring surveys conducted at least once in every 3 years
Calculation method (if applicable)	Ex post $LFR_{i,y}$ is determined by dividing the number of fused CFLs found from the ex post monitoring survey by the number of CFLs distributed, which is the CFL sample size of the survey. The survey is done on random sampling approach. The detailed calculation is shown in CER spreadsheet and also the monitoring survey report prepared by third party for individual CPA. Copy of the same is submitted to verifying DOE.
QA/QC procedures	Each SSC-CPA determined the representative sample size with minimum 90% confidence interval and 10% maximum error margin. The actual number of households to be surveyed was arrived at by dividing the number of sample CFL with the average number of CFLs distributed per household. To be conservative the minimum number of households surveyed was kept as hundred. The SSC-CPA implementer(s) has chosen a sample size higher than the one calculated in individual CPA-DD.
Purpose of data/parameter	Emission reduction calculation
Additional comments	CPA implementers have chosen the option 1, i.e. once in every 3 years to conduct the monitoring survey to calculate the LFR. The data of the survey was reported to the CME (BEE).

Data/Parameter	*Lamp distribution data*
Unit	--
Description	The start and completion date of CFL distribution, Utility consumer number of CFL recipient households under the SSC-CPA entered into the SSC-CPA database.
Measured/calculated/ default	Measured (and recorded in CPA database)
Source of data	SSC-CPA Database
Value(s) of monitored parameter	Distribution of CFLs-Start date: 11/05/2011 Distribution of CFLs- Completion date: 09/10/2011
Monitoring equipment	-
Measuring/reading/recording frequency	Once in the crediting period
Calculation method (if applicable)	-

[3] According to the clarification number SSC 670, after the first *ex post* monitoring survey and for the period before the subsequent *ex post* monitoring surveys undertaken the LFR value estimated *ex ante* shall be used without having to consider any *ex post* adjustment for the monitoring period..

QA/QC procedures	Standardized database form was used to maintain these data. Upon submission of the documented data, the same was verified independently by the CME (BEE) and has given approval to individual SSC – CPA. The approval letters for each CPAs are submitted to DOE.
Purpose of data/parameter	Emission reduction calculation
Additional comments	-

Data/Parameter	N
Unit	--
Description	Sample size of Monitoring Survey
Measured/calculated/ default	Calculated
Source of data	Calculated value as per statistical analysis provided in PoA-DD and CPA-DD
Value(s) of monitored parameter	1st ex-post monitoring survey: Number of households:1800 2nd ex-post monitoring survey Number of households: 350
Monitoring equipment	NA
Measuring/reading/recording frequency	Once at the time of each survey.
Calculation method (if applicable)	Calculated as mentioned in the Annexure 3 of respective CPA-DDs.
QA/QC procedures	Each SSC-CPA determined the representative sample size with minimum 90% confidence interval and 10% maximum error margin. The actual number of households to be surveyed was arrived at by dividing the number of sample CFL with the average number of CFLs distributed per household. To be conservative the minimum number of households surveyed was kept as hundred. The SSC-CPA implementer(s) has chosen a sample size higher than the one calculated in individual CPA-DD.
Purpose of data/parameter	Emission reduction calculation (Only the emission reduction formula is provided in the methodology)
Additional comments	Also refer “N” parameter table under section B.6.1 of respective CPA – DDs.

Data/Parameter	$P_{i, BL}$
Unit	W
Description	Rated power of the baseline ICLs of the group of “*i*”
Measured/calculated/ default	Calculated
Source of data	Weighted average calculated using rated power of the baseline ICLs as recorded in SSC-CPA database
Value(s) of monitored parameter	86.97
Monitoring equipment	NA
Measuring/reading/recording frequency	Once in the crediting period
Calculation method (if applicable)	Weighted average
QA/QC procedures	Number and type of ICLs collected in boxes is used to verify the numbers recorded in the ledger and database. This was also cross referred to the CFLs distributed as per project database
Purpose of data/parameter	Emission reduction calculation
Additional comments	Data was reported to BEE for record. The baseline ICL’s rated power

	was also verified during ICL destruction.

Data/Parameter	$P_{i,PJ}$
Unit	W
Description	Rated power of the CFLs of the group of "*i*" lighting devices (Watts)
Measured/calculated/ default	Calculated
Source of data	Weighted average calculated using rated power of the CFLs as recorded in SSC-CPA database
Value(s) of monitored parameter	17.05
Monitoring equipment	NA
Measuring/reading/recording frequency	Once in the crediting period
Calculation method (if applicable)	Weighted average
QA/QC procedures	The record of CFLs purchased and delivered in respective CPAs were used to verify the number recorded in the ledger and database. This was also cross referred to the ICLs collected.
Purpose of data/parameter	Emission reduction calculation
Additional comments	-

Data/Parameter	**$N_{Destroyed}$**
Unit	Number
Description	Number of ICLs collected and destroyed
Measured/calculated/ default	Measured (recorded)
Source of data	SSC-CPA database
Value(s) of monitored parameter	<table><tr><td>UNFCCC Ref. No.</td><td></td><td>3223-0001</td></tr><tr><td>Date of destruction of ICLs</td><td></td><td>21/10/2011</td></tr><tr><td>ICL Destruction Ageny</td><td></td><td>GEMS</td></tr><tr><td rowspan="2">No of ICLs collected & destroyed of each wattage type "i" ($N_{Destroyed}$)</td><td>$N_{Destroyed,60}$</td><td>140,515</td></tr><tr><td>$N_{Destroyed,100}$</td><td>290,732</td></tr></table>
Monitoring equipment	--
Measuring/reading/recording frequency	Once in the crediting period
Calculation method (if applicable)	--

QA/QC procedures	During CFL distribution activity: •Only 60 W and 100 W of working ICLs were accepted for bulb exchange during the CFL distribution activity. •The marking of the wattage of ICLs were checked before data recording in the ledger book. After completion of CFL distribution activity: •ICLs collected were stored in separate boxes according to the wattage and clearly labeled of their contents. •Destruction of ICLs was organized by qualified independent service provider (ISP) and total number of ICLs destroyed to be verified by the ISP. •All the ICLs were destroyed after the handing over to ISP. This has effectively limited the undesired secondary market effects and free riders activity. The ISP has provided destruction certificates for the same which are submitted to verifying DOE.
Purpose of data/parameter	Emission reduction calculation.
Additional comments	--

Data/Parameter	TD_y
Unit	%
Description	Average annual technical grid losses
Measured/calculated/ default	--
Source of data	AMS II-J default value
Value(s) of monitored parameter	10%
Monitoring equipment	-
Measuring/reading/recording frequency	Yearly
Calculation method (if applicable)	-
QA/QC procedures	Project participant checked technical T&D loss values specific to individual electricity distribution companies within the project area, using the T&D loss values confirmed by the electricity regulatory commission in recent tariff order documents published by electricity regulatory commissions that oversee these distribution companies. In the published tariff orders the technical and non-technical losses were not defined separately, therefore PP has considered 10% value as per the applied methodology AMS II-J version 3.
Purpose of data/parameter	Emission reduction calculation
Additional comments	-

E.3. Implementation of sampling plan

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Under this PoA sampling is required for determining the number of CFLs placed in service and operating (*ex-post $Q_{PJ,i}$ survey*) and CFL failure rate (*ex-post monitoring surveys for $LFR_{i,y}$*).

CPA under this monitoring period carried out first ex post monitoring survey integrating "$Q_{PJ,i}$" survey and the "$LFR_{i,y}$" survey.

Sampling Criteria adopted

1.Participating households under the CPA area

2.Random sample group determined using statistical tools as representing the households falling under the CPA area. Survey sample size was determined to have at-least 90% confidence interval and 10 % maximum margin of error[4].

The distributed CFLs in the CPA project area surveyed as per the applied methodology AMS-II.J. for the following two(2) monitoring parameters:

1)"$Q_{PJ,i}$" (number of CFLs with BLY logo, installed and operating), where the Q_{PJ} number is fixed for the entire crediting period;

Sampling Design –
The sampling is carried out as per the sampling plan design described in the Annexure 4 of the included SSC-CPA-DD. The survey records are maintained under the BLY database. The monitoring surveys were carried out by third parties. The survey procedures were established and implemented to ensure that the field data collection is performed properly and any potential intentional errors or unintentional errors are minimized and documented.

Considering that from a BLY scheme point of view, each of the households holds an equal probability of being identified from a DISCOMs active residential household customer base, hence simple random sampling was used.

To ensure random selection, random number generators were applied. Each household was allotted a unique CPA serial number starting at 1 and up to the total number of households in CPA area. Using random number generators, the serial number were randomly chosen. The random number thus obtained is correlated with the utility provided residential customer code.

Data Collection –
The following activities were done before collecting the data from households as per the section E.7.2 of registered PoA –DD

- Detailed instructions were given to the survey agency/surveyor(s) on data collection procedures and determination of household sample size.
- Standardized data forms were developed and were used for the data collection during Survey(s).

Accordingly, an appropriate statistically robust sample size for conducting the monitoring survey has been used.

Data Analysis -
The data collected though the standard forms through the surveys was compiled and collated. CPA Baseline, Survey Baseline and Survey findings were determined after conducting survey as follows:

CPA Baseline: From the CPA household database for all the CPA households, the total number of CFLs distributed with BLY logo was taken for each wattage type 'i'.

Survey Baseline: From the CPA household database for the selected sample of households, the total number of CFLs distributed with BLY logo was taken for each wattage type 'i'.

Survey Findings: From the survey findings for the selected sample of households, the total number of BLY logo CFLs installed and operating was found for each wattage type 'i'.

The Q_{PJ} value for each type of CFL type 'i'is calculated as presented in $Q_{PJ,i}$ table of section D.2

= Ratio of (Survey Findings/Survey Baseline) x CPA Baseline, for each wattage type.

To be conservative, the calculated $Q_{pj,i}$ is compared with the number of ICLs destroyed and minimum of the two is taken as the final $Q_{pj,i}$ value. The claimed number of lamps is capped by the number of ICLs destroyed.

The calculated Q_{PJ} values are as follows:

[4] As per AMS II.J ver. 03 methodology

Sample size of monitoring survey (N)	No. of CFLs of type "i" claimed to be distributed in sample households		No. of CFLs with BLY logo of type "i" found installed and operating in the sample households		Number of CFLs in service and operating under 1st monitoring survey ($Q_{PJ,i}$)		
	11W	20W	11W	20W	11W	20W	Total
1,800	1,485	3,038	1,444	2,935	136,635	280,875	417,510

Confidence/ Precision -
The applied methodology AMS-II.J ver. 03 requires a minimum 90% confidence interval and the 10% maximum error margin. Annexure 4 of respective CPA-DDs has been followed to achieve this level of precision.

2)"$LFR_{i,y}$" (lamp failure rate of type i) in the CPA area.

Sampling Design –
The CPA follows the sampling approach described in the Annexure 3 of the respective CPA -DDs.

The surveyor appointed by the CPA implementer has

- Randomly selected a sample of households from CPA household database. The number of households included in the sample was equal to or more than the calculated values mentioned in Annexure 4 of the included CPA-DDs.
- For the identified households the survey identified the number of CFLs for each type of wattage 'i' with BLY logo which are installed and not operating
- CFLs replaced as a part of regular maintenance or warranty program was counted as operating.

However during the survey no CFLs were replaced to count those as operating.

Data Collection –
The following activities were done before collecting the data from households as per the section E.7.2 of registered PoA -DD

- Detailed instructions were given to the survey agency/surveyor(s) on data collection procedures and determination of household sample size.
- Standardized data forms were developed and were used for the data collection during Survey(s).

Accordingly, an appropriate statistically robust sample size for conducting the monitoring survey has been used.

Data Analysis –
The data collected though the standard forms through the surveys was compiled and collated centrally.

Survey Baseline and Survey findings were determined after conducting survey as follows:

Survey Baseline: From the CPA household database for the selected sample of households, the total number of CFLs distributed with BLY logo was taken for each wattage type.

Survey Findings: From the survey findings for the selected sample of households, the total number of BLY logo CFLs installed and operating was found for each wattage type.

The Lamp Failure Rate is calculated as

= 1- (Survey Findings/ Survey Baseline), for each wattage type i.

The value of the $LFR_{i,y}$ considered for the calculation of the emission reductions is higher of the value obtained from:

a)The life test curve submitted by CFL manufacturer/ accredited laboratory for the CFLs distributed in the CPA area
b)The ex-post monitoring survey results.

The calculated LFR values are 25.40% for 11W CFLs and 25.57% for 20W CFLs for year 4.

Sample size of second monitoring survey (N)	No. of CFLs of type "i" claimed to be distributed in sample households		No. of CFLs with BLY logo of type "i" found installed and operating in the sample households		Lamp Failure Rate for CFLs ($LFR_{i,y}$)		
	11W	20W	11W	20W	11W	20W	Total
350	315	567	235	422	25.40%	25.57%	25.52%

The subsequent linear failure rate curve reconstructed for the remaining crediting period based on the slope determined from step (a) and (b) above. This reconstructed curve shall be valid for credit issuance for either 3 years or 30% of the elapsed rated life of the lamp, selected as the minimum frequency of the ex-post monitoring survey in the section B.5.2 of the included CPA-DDs.

Confidence / Precision -
The applied methodology AMS-II.J ver. 03 requires a minimum 90% confidence interval and the 10% maximum error margin. Annexure 4 of respective CPA-DDs has been followed to achieve this level of precision.

SECTION F. Calculation of emission reductions or net anthropogenic removals

All the CPA-DDs make use of equations listed under section E.6.2 of PoA-DD, where the emission reductions due to the project activity are calculated as under.

Emissions Reduction (ER_y)

Emission reduction (ER_y) is net electricity savings ($NES_{,y}$) times an emission factor ($EF_{CO2,ELEC,y}$)

$ER_y = NES_{,y} \times EF_{CO2,ELEC,y}$ **(1)**

Where:

ER_y Emission reductions in year y (tCO_2e)

NES_y Net electricity saved in year *y* (kWh)

$EF_{CO2,ELEC,y}$ Grid Emission factor (GEF) in year *y*,(t_{CO2e}/MWh);
The calculated GEF value is fixed ex-ante in the SSC-CPA.

Net Energy Savings (NES_y)

The net energy saved is derived using the equation (2) below:

$NES_{,y} = \sum_i Q_{PJ,i} * (1-LFR_{i,y}) * ES_i * [1 / (1 - TD_y)] * NTG$ **(2)**

Where:

$ES_i = (P_{i,BL} - P_{i,PJ}) * O_i * 365 / 1000$ **(3)**

Where:

NES_y	Net electricity saved in year *y* (kWh)
$Q_{PJ,i}$	Number (quantity) of CFLs of wattage "i" distributed or installed under the project activity. In total for all "i", this value shall be equal to or less than the documented number of all baseline ICLs destroyed. Once all of the project CFLs are distributed or installed, $Q_{PJ,i}$ is a constant value independent from *y*. Under the PoA, $Q_{PJ,i}$ obtained from the *ex post* $Q_{PJ,}$ survey, which is to take place within the first 12 months of CFL distribution.
i	Counter for lighting device type e.g. 40W incandescent bulb, 11 W CFL
n	Number of types of lighting devices
ES_i	Estimated annual electricity savings for equipment of type *i,* for the relevant technology viz. ICL or CFL(kWh)
$LFR_{i,y}$	Lamp Failure Rate for CFL equipment type *i* in year *y* (fraction). Under the PoA, this is calculated ex-ante using the equation (4) below and adjusted ex-post based on monitoring survey results.
TD_y	Average annual technical grid losses (transmission and distribution) during year *y* for the grid serving the locations where CFLs are installed, expressed as a fraction. Under the PoA, each CPA determined the TD_y from the most recent average annual audited data published either by the DISCOM or an official governmental body e.g. by the Central Electricity Authority (CEA) of India, Electricity Regulatory Commission(s). A default value of 10% shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.
NTG	Under the PoA, the default value of 0.95 is applied.
$P_{i,BL}$	Rated power of the baseline lighting devices (ICLs) of the group of type *i* lighting devices (Watts)
$P_{i,PJ}$	Rated power of the project lighting devices (CFLs) of the group of "i" lighting devices(Watts)
O_i	Under the PoA, the value of 3.5 hours per 24 hrs period is applied in all SSC-CPAs.

To calculate the emission reductions from a CPA area, the equations under the CPA-DD section B.5.2 are applied as per project values.

$Q_{pj,i}$ Calculation

The $Q_{pj,i}$ value is obtained from the findings of the $Q_{pj,i}$ survey as follows:

Parameter Description	60W	100 W
Number of ICLs collected and destroyed; $N_{Destroyed}$	140,515	290,732

Parameter Description	11W	20 W
Number of CFLs distributed or installed as per database	140,515	290,732
Percentage of CFLs found in service and operating under 1st ex-post monitoring survey (%)	97.24%	96.61%
Number of CFLs in service and operating under 1st monitoring survey; $Q_{PJ,i}$	136,635	280,875

Lamp Failure Rate Calculation

The LFR value is calculated from the findings of the ex-post monitoring survey as follows:

Counter for year	5	6
Rated average life for CFLs; L_i	10000	
% of CFLs operating at the rated lifetime; R_i	50	
Number of operating hours of CFL; X_i	1281.0	1277.5

Now
For Y=5
3*1277.5 + 2*1281.0<10.000

And
For Y=6
4*1277.5 + 2*1281.0 <10.000

Thus ,

$$LFR_{i,5} = (3*1277.5 + 2*1281.0) * (100 - 50) / (100 * 10000)$$
$$= 31.97\%$$

And

$$LFR_{i,6} = (4*1277.5 + 2*1281.0) * (100 - 50) / (100 * 10000)$$
$$= 38.36\%$$

Estimated Annual Energy Savings

$$ES_i = (P_{i,BL} - P_{i,PJ}) * O_i * 365 / 1000$$

Weighted average of rated power of the baseline lighting devices (ICLs); $P_{i,BL}$	***86.97 W***
Weighted average of rated power of the project lighting devices (CFLs); $P_{i,PJ}$	***17.05 W***
Average daily operating hours of ICLs replaced by CFLs; O_i	***3.5***

Thus estimated electricity savings,

for first 282 days in this monitoring period, i.e. y=5 (01/01/2016 to 08/10/2016)
$$ES_5 = (86.97 - 17.05) * 3.5 * 282/1000$$
$$= 69.00 \text{ kWh}$$

for next 202 days in this monitoring period, i.e. y=6 (09/10/2016 to 28/04/2017)
$$ES_6 = (86.97 - 17.05) * 3.5 * 202/1000$$
$$= 49.43 \text{ kWh}$$

Net Energy Savings

$$NES_y = \sum_i Q_{PJ,i} * (1-LFR_{i,y}) * ES_i * [1 / (1 - TD_y)] * NTG$$

Counter for year	5	6
Number of CFLs in service and operating under 1st ex-post monitoring survey; $Q_{PJ,i}$	136,635	280,875
Average annual technical grid losses during year y; TD_y (%)	10%	10%
Net-to-gross adjustment factor; NTG	0.95	0.95
LFR_i	31.97%	38.36%

Thus net energy savings

NES_5= 417,510*(1-31.97%)*69.00*(1/(1-0.10))*0.95 = 20,687

NES_6= 417,510*(1-38.36%)*49.43*(1/(1-0.10))*0.95 = 13,427

NES = 20,687 **+** 13,427 **= 34,114 MWh**

Emission Reductions

$ER_y = NES_{,y} \times EF_{CO2,ELEC,y}$

Where, $EF_{CO2,ELEC,y}$ **=** 0.856 tCO_2/MWh

Thus, ER_y = 34,114 * 0.856
= 29,201 tCO_{2e}

The implementation of this PoA resulted in greenhouse gas emission reduction of 29,201 tonnes of CO_2 equivalent during the current monitoring interval.

F.1. Calculation of baseline emissions or baseline net removals

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F.2. Calculation of project emissions or actual net removals

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F.3. Calculation of leakage emissions

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F.4. Calculation of emission reductions or net anthropogenic removals

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
3223-0001	-	-	-	-	29,201	29,201

F.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the included CPA-DDs

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante (t CO_2e)
3223-0001	29,201	42,034

F.6. Remarks on increase in achieved emission reductions

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Actual Value is less than the estimated value. The difference is due to the less number of CFLs distributed as compared to what was assumed during CPA inclusion

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Document information

Version	*Date*	*Description*
02.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for programmes of activities (CDM-EB93-A07-STAN); • Make editorial improvements.
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