



CDM Based DSM Initiative in India

Presentation by

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Energy Efficiency Potential and Outcome

Energy Conservation potential assessed as at present (IEP) (15% by DSM)	20000MW
Verified Energy Savings :	
-During X Plan period	877 * MW
-During 2007-08	623 MW
-Estimated for 2008-09	1200 MW
-Target for XI Plan period (5% reduction of energy consumption)	10000 MW

** Only as indicated by participating units in the National Energy Conservation award scheme, for the previous five years.*

Legal and Policy Interventions to Promote Energy Efficiency

- **Energy Conservation Act, 2001, overcomes some market barriers by enabling:**
 - Setting of minimum energy standards for, and affixing energy-consumption labels on appliances and equipment
 - Promulgation of Energy Conservation Building Codes
 - Energy use monitoring, verification and reporting by large energy users, and the establishment of energy consumption norms for these consumers
- **BEE and SDAs set up to promote:**
 - Demand-side management by distribution companies
 - Enhancing energy conservation in existing buildings, especially through Energy Service Companies (ESCOs)
 - Outreach and awareness programmes

Policy Objectives

- Inclusive and sustainable development strategy, sensitive to climate change.
- Achieving national growth objectives through a qualitative change in direction leading to further mitigation of greenhouse gas emissions.
- Devising efficient and cost-effective strategies for end use Demand Side Management- ESCO delivery mechanisms, CDM, etc
- Engineering new and innovative forms of market, regulatory and voluntary mechanisms to promote energy efficiency
- Effecting implementation of programmes through unique linkages, including with civil society and local government institutions and through public-private-partnership.
- International cooperation

Energy Efficiency - Action Plan

- Bachat Lamp Yojana to promote energy efficient and high quality CFLs as replacement for incandescent bulbs in households.
- Standards & Labeling Scheme targets high energy end use equipment and appliances to lay down minimum energy performance standards.
- Energy Conservation Building Code (ECBC) sets minimum energy performance standards for new commercial buildings.
- Agricultural and Municipal DSM targeting replacement of inefficient pumpsets, street lighting, etc.
- Operationalising EC Act by Strengthening Institutional Capacity of State Designated Agencies (SDAs) : The scheme seeks to build institutional capacity of the newly created SDAs to perform their regulatory, enforcement and facilitative functions in the respective States.
- Energy Efficiency Improvement in Small and Medium Enterprises (SMEs): To stimulate energy efficiency measures in 25 high energy consuming small and medium enterprise clusters.



National Mission for Enhanced Energy Efficiency- 4 New Initiatives

- A market based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities, through certification of energy savings that could be traded. (Perform Achieve and Trade)
- Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable. (Market Transformation for Energy Efficiency))
- Creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings. (Energy Efficiency Financing Platform (EEFP))
- Developing fiscal instruments to promote energy efficiency namely Framework for Energy Efficient Economic Development (FEEED)

CDM Based CFL Scheme- Bachat Lamp Yojana (BLY)





CDM Based CFL Scheme- Bachat Lamp Yojana (BLY)- Policy Objectives

- ✓ Lighting accounts for about 22% of electricity use
- ✓ Penetration of CFLs in household sector ~ 10%. In commercial sector almost 95%
- ✓ High first cost the barrier – difference between price of incandescent and CFL ~ 10 times
- ✓ Information asymmetry for households
- ✓ Over 800 million incandescent bulbs produced every year – CFLs around 200 million
- ✓ Various measures taken to overcome the price barrier- bulk procurement, incentive schemes, etc.
- ✓ CDM based scheme most attractive.



CDM Based CFL Scheme- Bachat Lamp Yojana (BLY)

- ✓ Launched by Minister of Power on 25th February, 2009
- ✓ Scheme seeks to replace estimated 400 million incandescent bulbs by CFLs- could save 6000 MW by 2012
- ✓ BEE has prepared a Programme of Activities (PoA) as a voluntary coordinated effort to facilitate the scheme in the entire country and reduce transaction costs
- ✓ 22 CFL manufacturers/ suppliers have agreed to participate- 14 states have initiated the scheme
- ✓ Pilot projects in Andhra Pradesh registered by CDM Executive Board
- ✓ Leveraging of CDM revenues to remove the high first cost barrier- market transformation in favour of efficient lighting

Basic Objectives of BLY

- Replace inefficient incandescent bulbs with CFLs **for households only**
- Reduce price of CFL to that of incandescent bulb-project developer (CFL Manufacturer/ DISCOM) provides initial investment
- Use CDM to recover balance cost
- Monitor energy consumption reduction in a project area as outlined in AMS-II.C of CDM-EB
- CERs generated after monitoring, validation and oversight of CDM Executive Board (CDM-EB) sold in international markets
- Revenue from sale of CERs used to service investments-Estimated revenue/ CFL of Rs. 25 per year- cost recovered in 2-3 years.
- Potential reduction in power consumption~6,000 - 10,000 MW – **XI plan target 4000 MW**

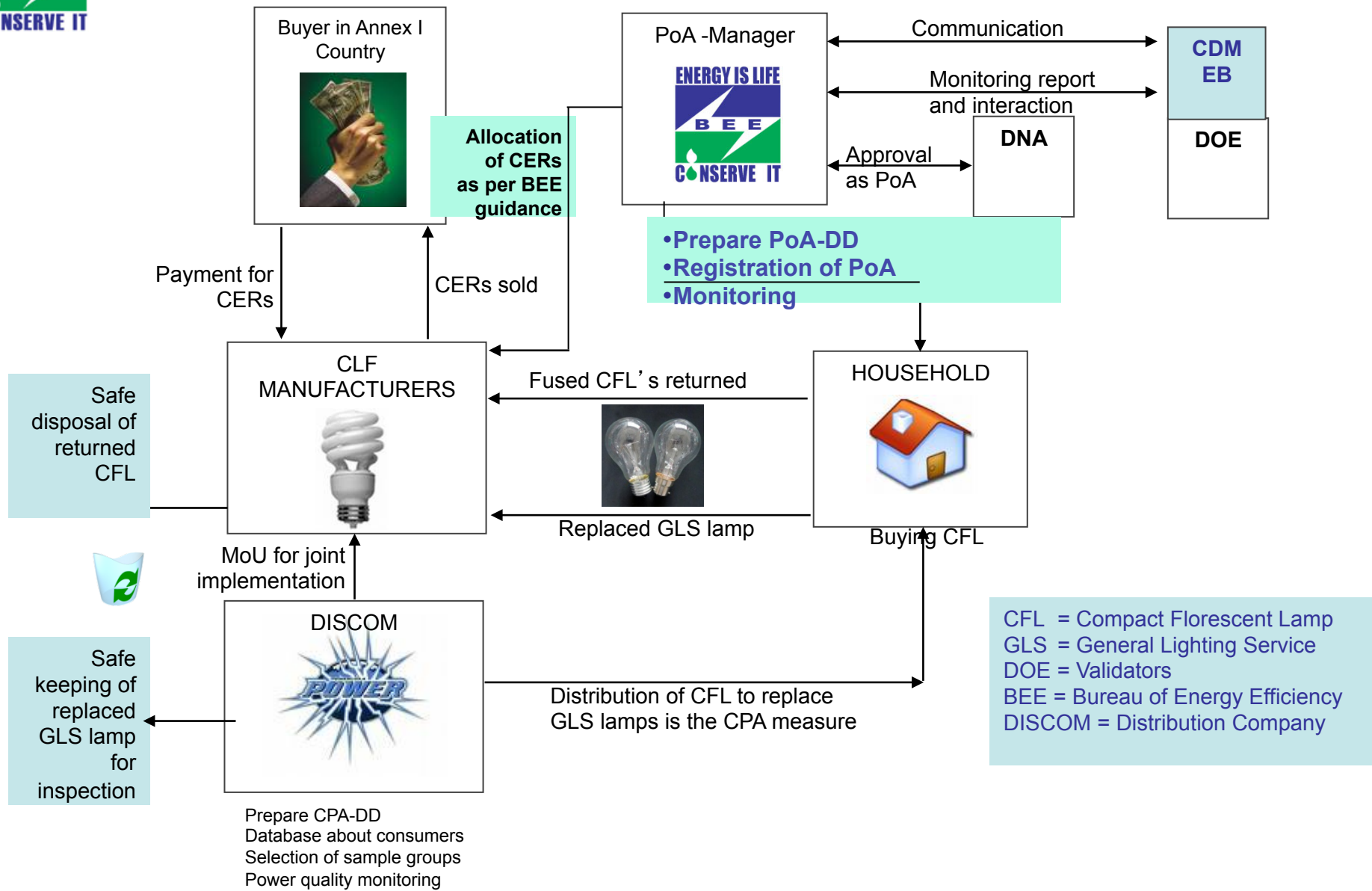
Project Steps

- Define project area- DISCOM based
- Manufacturer/ Trader of CFL for provision of adequate numbers of bulbs required
- Preparation of Project Design Document (PDD) as per CDM-EB approved templates
- Validation of PDD by certified agencies of CDM-EB- presently 5-6 in India
- PDD, on validation, considered and recommended by Designated National Authority (DNA) of CDM-EB - MOEF
- DNA recommended PDD posed for final approval of CDM-EB
- Monitoring/ validation commences as per AMS-II.C under this framework
- **Programmatic Approach to reduce individual project transaction costs for replicability**

Programmatic Approach

- **Programmatic approach allowed as a voluntary, coordinated effort-** AMS-II.C allowed to be used in PoA by EB in July, 2007
- Allows for an umbrella framework with many individual projects under an approved methodology
- The multiple PDDs (called CDM Project Activities- Design Documents CPA-DD) part of the PoA
- All PDDs have same monitoring/ validation requirements
- Approval process of individual PDDs simplified substantially- no individual approval of PDDs by EB
- PoA can be run by any agency including government

Programme Landscape under CDM Methodology AMS-II.C



Role of BEE

- Awareness and information
- Development of Programme of Activities Design Document (POA-DD)
- Registration of Programme of Activities with UNFCCC CDM Executive Board.
- Monitoring of CFL use in sample households
- Support the CFL manufacturers/ DISCOMs to prepare CDM Programme Activity Design Documents (CPA-DDs)
- Inclusion of CPA-DDs under the PoA after validation
- Facilitate verification of CERs and recommend their allocation to the CFL manufacturers / DISCOM according to their share in emissions reductions in a specified period

Role of DISCOM

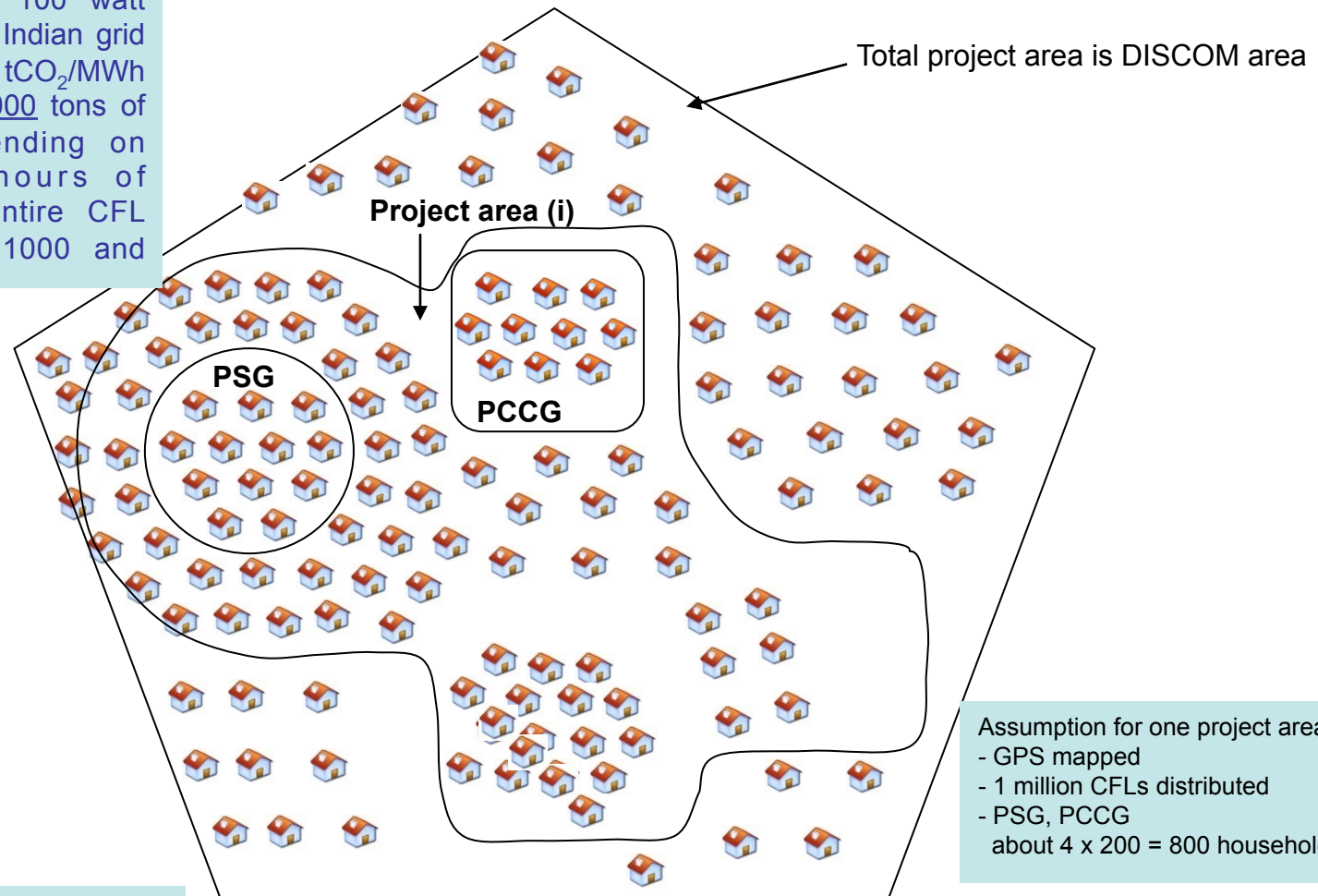
- Database of households to include name of users/ address/average electricity consumption
- Assist in selection of **Project sample group (PSG)**, **Project sample buffer group (PSBG)**, **Project cross-check group (PCCG)** as required under AMS-II.C
- Information on Grid voltage supplied to
- Distribution of CFL Lamps and exchange of incandescent lamps
- Safe keeping of replaced GLS lamps for independent inspection
- Determination of the power correction factor
- Estimation of technical distribution losses in the electricity grid

Role of CFL Suppliers

- **Provide CFL at the price comparable to GLS lamps.**
- Preparing CDM Programme Activity Design Documents (CPA-DDs) for CDM project and submitting them to BEE.
- Collection of fused CFLs through buy-back schemes, and arranging for their safe disposal.
- Distribution of CFLs in association with DISCOM
- Initial investment for the cost differential
- Free Replacement of CFL during the life of project
- **Tripartite Agreement between BEE, DISCOM and CFL Supplier**

Groups involved in CFL Methodology AMS-II.C

1 Million CFL (18 Watt) distributed to replace 100 watt GLS will based on the Indian grid emission factor of 0.86 tCO₂/MWh earn about 50,000-75,000 tons of CO₂ per year depending on average annual hours of illumination of the entire CFL population, between 1000 and 1500



PSG = Project sample group
PCCG = Project cross-check group

Monitoring by GSM Based Smart Meters



Implementation Steps

- Institute survey to assess penetration of CFLs in households
- Initiate one or two pilots in densely populated residential areas where the penetration of CFLs is low
- Select CFL supplier by a process of bidding from the list maintained by BEE- % share of CERs given to DISCOM to be the bidding selection parameter
- Sign TPA with BEE and CFL supplier
- Preparation of project documentation
- Installation of meters and distribution of CFLs



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Monitoring Steps under AMS-II.C

- **Step 1:** Determination of the project area (s)-Based on DISCOM areas each with a maximum of 1 million CFLs – could be more than 1 CPA area in a DISCOM with a cap of 60 GWh (60 MUs) (around 1 million CFLs).
- **Step 2:** Establishment of a project activity implementation plan
- **Step 3:** Installation of measurement equipment
- **Step 4:** Establishment of PSBG
- **Step 5:** Establishment of CPA database

Monitoring Steps under AMS-II.C...

- **Step 6:** Monitoring of utilization hours in the PSG
- **Step 7:** Determination of the power correction factor
- **Step 8:** Calculation of the mean and standard deviation of household electricity consumption for lighting
- **Step 9:** Estimation of technical distribution losses in the electricity grid
- **Step 10:** Cross-check of monitoring results by random sampling of households not included in the PSG and PSBG
- **Step 11:** Calculation of emission reductions