

# **F**INAL **R**EPORT

## **ECAP STRATEGY AND IMPLEMENTATION ROADMAP**

**FOR THE STATE OF PUNJAB**

**Prepared under**



**USAID ECO-III Project**



**Punjab Energy Development Agency**

**(STATE DESIGNATED AGENCY)**

**Chandigarh, India**

**September 2008**

## Acknowledgements

The Five Year State Level Energy Conservation Action Plan for the State of Punjab was drafted by International resources Group (IRG) under the USAID ECO-III Project. This led to the demand for ECAP Strategy and Implementation Road Map document for triggering substantial impacts in a few key sectors. IRG would like to acknowledge the constant encouragement, advice, and constructive input provided by:

- Mr. A.S. Chhatwal, IAS , Secretary to Govt. of Punjab , Department of Science & Technology and Environment Punjab and Chairman , PEDA
- Mr. T.P. S. Sidhu , Chief Executive Chief Executive , PEDA
- Mr. Balour Singh , Director , PEDA
- Mr. Balkar Singh , Senior Project Manager, PEDA
- Mr. Paramjit Singh , System Engineer
- Mr. Singara Singh , PEDA

IRG would like to acknowledge the guidance from Mr. S. S. Sekhon, ex- Director, PEDA and Mr. M. P. Singh, Joint Director at several stages especially the inception of the IRG activities in the state of Punjab.

IRG appreciates the keen support provided by BEE, especially the Dr. Ajay Mathur, Director General, Bureau of Energy Efficiency (BEE) and Mr. Jivesh Nandan, National SDA Coordinator, BEE for providing key inputs in drafting the ECAP.

Finally, IRG would like to acknowledge the support of USAID without which this effort would not have been possible. The entire ECO-III team is also greatly appreciative of Dr. Archana Walia, Cognizant Technical Officer, for her support and guidance through out the duration of this activity.

# Table of Contents

<b>Executive Summary</b> .....	2
1 Introduction .....	2
1.1 Background .....	2
1.2 Objectives and Framework of the Ecap .....	2
1.3 BEE Deliverables as Requirement for EC Act Funding .....	3
2 Structure of Road Map .....	4
2.1 Justification .....	4
2.2 Integrated Objectives and Activities Table .....	4
2.3 PED A ECAP Work Plan .....	5
2.4 Partner’s Roles Table .....	5
3 On-Going EE Activities in Punjab .....	6
3.1 Punjab State Programs .....	6
3.2 Peda Programs .....	6
3.2.1 Energy Conservation Action Plan Team (ECAT) .....	6
3.2.2 Mandatory Measures Announced .....	6
3.2.3 Work in Cooperation with USAID/IRG .....	7
3.2.4 Work in Cooperation with ADEME, France .....	7
3.2.5 Industry .....	7
3.2.6 Buildings .....	7
3.2.7 Energy Conservation Building Code (ECBC) .....	8
3.2.8 Lighting .....	8
3.2.9 Mass Awareness Activities .....	8
3.3 Contribution of other Agencies .....	9
4 Energy Conservation Action Plan: Program Overview .....	9
5 Strengthening EE Function at PED A .....	13
5.1 PED A Organizational Transition .....	13
5.2 PED A Strengths .....	13
6 Budget .....	14
7 Monitoring and Evaluation Plan .....	14
8 Concluding Remarks .....	14
 Annex-A	
Integrated Objectives and Activities-PED A Energy Conservation Action Plan .....	14
 <b>Annex-B</b>	
Partner’s Role for Implementing Energy Conservation Action Plan .....	20

# 1 INTRODUCTION

## 1.1 BACKGROUND

Recognizing the importance and value of energy conservation in overall energy planning, the Government of India enacted the EC Act of 2001. As part of this Act, all Indian States have been directed to identify a State Agency to oversee and lead the implementation of energy conservation activities at the state level. In order to receive funding set aside by the Act to support these activities, each state has been requested to develop an Action Plan which will serve as the roadmap for that work. The Bureau of Energy Efficiency (BEE), created through the EC Act has developed a base set of certain deliverables which must be addressed by the plan. Punjab Energy Development Agency (PEDA) has been designated by the State as the nodal agency responsible for spearheading EE efforts to identify and oversee energy conservation programs, including those mandated by BEE. In addition to the planning, oversight and guidance of activities, PEDA will coordinate, regulate and enforce the provisions of the EC Act.

Punjab is well-positioned to take a leadership role in promoting the introduction of energy conservation throughout the state. It has already successfully initiated EE activities through PEDA, it has a supportive state government that is already spearheading energy audits, and USAID/ECO-III is also working in Punjab on complementary programs like SME EE activity financing and implementing energy efficiency in public buildings.

However, in spite of the obvious benefits of energy efficiency to State and National economies, there remain many institutional barriers. The U.S. Agency for International Development, India Mission (USAID/India) is providing technical assistance to address these barriers through the Energy Conservation and Commercialization Program, which is now in its third phase (ECO-III).

## 1.2 OBJECTIVES AND FRAMEWORK OF THE ECAP

The objective of the Action Plan is to take advantage of the many EE opportunities available in Punjab and systematically implement a series of activities that will achieve real results for industry, buildings, utilities and the public. If successful, the ECAP is expected to achieve, over a five year period, a reduction of between 2-3 % in energy consumption.

At present, Punjab currently faces a peak power capacity shortage to the tune of 12% and electricity shortage around 8%. The demand for power supply is increasing day by day. In such a scenario, energy efficiency and Demand Side Management (DSM) can help in mitigating power shortage and thereby drastically reduce our capital needs for power capacity expansion. The potential for energy conservation exists in our state in industry, agriculture, building, commercial, transportation & domestic sectors where energy conservation can be realized to the largest extent at the lowest cost. As per its Policy enunciated in 2006, the State Govt. is committed to conserve energy in these sectors to the extent of 20% by the year 2020.

The broad objectives of the Punjab Energy Conservation Action Plan (ECAP) include:

1. To proactively fulfill all the mandates of EC act in co-ordination with BEE and State Government, and other stakeholders.

2. To promote the cause of energy efficiency addressing all commercial energy sources. (E.g. coal, liquid petroleum gas, oil and electricity).
3. Reduction of energy consumption in generation, transmission, distribution (through end use DSM programmes) and large scale end use energy efficiency improvements, rational and judicious use.
4. To address the concerns of utilities such as demand shortage as well as power shortages through focused DSM initiatives.
5. To promote reduction of GHG emissions in the State of Punjab.
6. To promote use of energy efficient technologies, equipment, processes, and appliances.
7. To promote awareness in respect of EC Act, energy efficiency, standards, best practices, etc.
8. To create awareness in the state regarding national energy efficiency programs such as Energy Conservation Building Code to promote energy efficiency in buildings and Standards and labeling to promote manufacture and use of energy-efficient appliances.
9. To reduce energy consumption in Domestic Sector through User Education and awareness creation.

### 1.3 BEE DELIVERABLES AS REQUIREMENT FOR EC ACT FUNDING

In order to receive funding from BEE to meet these objectives, BEE requires that the following specific 22 deliverables be included in Action Plan activities:

1. Establish an Internet Platform for Communication with SDA
2. Prepare list of Certified Energy Managers (CEMs) and Accredited Energy Auditors (AEAs) which work or reside in the State (ESCOs)
3. Prepare a list of Designated Consumers (DCs) and their Energy Consumption
4. Preparation of Set of Forms concerning communication of data and other information with BEE
5. Half yearly State level meeting with CEMs and AEAs to discuss duties and responsibilities as well as joint progress
6. Annual State Level Conference of energy intensive industry, as well as CEMs and AEAs
7. Half Yearly meeting for exchange of information about lessons learned on State level implementation of EC Act
8. Annual meeting of all SDAs to discuss progress and next year's action plan with BEE
9. Design and Printing of Promotional Material to be distributed to all four stakeholders: CEMs, AEAs, DCs and general public
10. Conduct mandatory refresher course for CEAs and Energy Managers
11. Implementation and conduct of Life Long Learning (3L) Program of BEE for CEMs and AEAs and other interested parties
12. Training of DCs for annual reporting of Energy Data
13. Collection of data concerning manufacturing as well as sales of household appliances and other equipment at State level falling under the EC Act
14. Annual report about State wise sales of labeled household appliances and other energy intensive equipment
15. Annual survey and analysis of impact of EC Act, based on reports of AEAs and Energy Managers and other sources of information in the State

16. Preparation and publishing of annual year book of energy conservation measures at State Level
17. Survey of buildings at State level which fall under the EC Act
18. Preparation of report and analysis of State level incentive as well as disincentive policies concerning energy conservation measures in energy intensive industries including power sector
19. Preparation of recommendation for streamlining EC State level policies concerning energy conservation
20. Suggest State Government to establish State Energy Conservation Fund
21. Implementation of EC Act in the State
22. Co-ordination with BEE, State Government, Central Government and other stakeholders

## 2 STRUCTURE OF ROAD MAP

### 2.1 JUSTIFICATION

PEDA has already Developed a five-year Energy Conservation Action Plan (2007-12), which is somewhat similar to the one developed by all state designated agencies as per guidance provided by BEE. The approach for five year ECAP document delineates fiscal resources for 22 deliverables defined as per BEE guidance with limited support provided by BEE, progressive states like Punjab are not able to develop momentum for EC activities as planning tool necessitates lot of parallel efforts at the state. The ECAP Implementation Road Map document is a complementary tool for result orientation of the state designated agencies.

The purpose of this document is to highlight a holistic approach for programmatic activities by citing a few crucial programs. This document provides some missing links in the ECAP document developed by PEDA as per the guidance provided by BEE to all state designated agencies by re-nunciating key ideas and tasks but presenting a reasonable framework for momentum building for energy conservation program within the state of Punjab. Accordingly, all the tasks enlisted in the ECAP document have not been included in the original format as these programs including the ones listed here are evolving with time. Emphasis of this document is on the planning tools rather than a comprehensive five year resource plan. Both these documents can be useful for PEDA to develop pathways to intensive implementation of EC programs within the state.

In order to match deliverables to objectives, determine where ongoing work (and stakeholders) fits into this program and can be built upon, and develop a mechanism to whereby progress can be monitored and evaluated throughout its implementation, ECO-III has developed a series of management tools and program categories. These will be discussed in more detail in section four. However, a summary of these management tools is provided below:

### 2.2 INTEGRATED OBJECTIVES AND ACTIVITIES TABLE

This table organizes Punjab's ECAP objectives and BEE deliverables under the framework of 10 programmatic categories. This tool was developed for easier implementation by the responsible

party, awareness of key stakeholders to be involved and monitoring of progress and results. The 10 programs are divided into two key activities: (A) reduction of energy consumption in the major sectors and (B) capacity building and institutional strengthening. Thus, Program (A) is the direct implementation of BEE deliverable 21 and Program (B) provides for the capacity building and institutional strengthening of partners and key organizations involved in delivering (A). Detailed activities of each program and sub-program are provided in the table as well as specific deliverables and results expected for each program.

**PROGRAM A: REDUCTION OF ENERGY CONSUMPTION IN MAJOR SECTORS**

- A1 Large Consumers and Textile Industry
- A2 Small and Medium Enterprises
- A3 Municipalities and Urban and Local Bodies
- A4 New and Existing Buildings

**PROGRAM B: CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING**

- B1 Public Awareness, Outreach & Knowledge Sharing
- B2 PEDAs Capacity Building
- B3 Stakeholders Capacity Building

**2.3 PEDAs ECAP WORK PLAN**

This spreadsheet with a time table for each specific activity within the programs, identifying the lead partner and listing expected outcomes for these activities need to be developed carefully once framework is accepted. A monitoring and evaluation scheme will be developed based on these expected outcomes, with milestones along the way to monitor progress. It is expected that the lead for each individual sub-program will develop a similar table at a more detailed level to use to monitor and track implementation progress.

**2.4 PARTNER'S ROLES TABLE**

Given that there are many on-going activities in energy efficiency in Punjab state as well as key stakeholders with whom PEDAs will want to partner to implement the action plan, it became important to acknowledge those efforts and understand how they best fit into the Action Plan's activities so that efforts are not duplicated but build upon. This table clarifies which stakeholders should be involved in which program, what activities they are currently involved with that is relevant to that program and what role they might be expected to play in implementing the ECAP.

These three tools taken together with communications and information tools that will be prepared as part of the BEE deliverables, will assist PEDAs with the implementation, monitoring and oversight of the ECAP as a whole in a way that is transparent and clear to all partners.

## 3 ON-GOING EE ACTIVITIES IN PUNJAB

While a great deal remains to be done, Punjab has been quite active in the area of energy efficiency. It is important to recognize these achievements, their champions and promoters so that the ECAP can tap into their implementation and partnering experience and build on their success. We summarize these on-going activities below:

### 3.1 PUNJAB STATE PROGRAMS

There are several organizations and private sector entities actively involved in pushing forward the agenda of energy conservation or implementing projects that will contribute to efficiency recommendations and/or reducing consumption of energy. These are briefly described below:

### 3.2 PEDDA PROGRAMS

The role of PEDDA as SDA is to create general awareness among masses about the importance and benefits of energy conservation measures and also to institutionalize the energy efficiency project implementation in the industry, govt. buildings & commercial buildings. The purpose of the state Energy Conservation Action Plan is to pursue a harmonious growth in energy efficiency ethos by intensifying these efforts in different consumers in the state of Punjab in line with those advocated by Bureau of Energy Efficiency and practiced in India and other countries. PEDDA achievements under the Energy Conservation Programmed are given below:-

#### 3.2.1 ENERGY CONSERVATION ACTION PLAN TEAM (ECAT)

State Level Energy Conservation Action Plan Team (ECAT) has been constituted under Energy Conservation Act-2001 to enable harmonization of Energy Conservation Policy across different sectors in the state.

#### 3.2.2 MANDATORY MEASURES ANNOUNCED

- Mandatory use of Compact Fluorescent Lamps (CFLs) in Govt. buildings/Govt. Aided Institutions /Boards /Corporations. (State Govt. directive issued on 22.8.2007 to replace incandescent bulbs with Cols in all Govt. buildings and offices, including Government Guest Houses, Offices of Board, Corporation, Cooperative Organizations and Municipalities not later than three months from the date of issue)
- Mandatory use of BIS marked Motor Pump sets, Power Capacitor, Foot/Reflex valves in Agriculture sector.
- Mandatory use of compact fluorescent lamps for Agricultural consumers (Punjab is the first State in the country to have issued such a directive. It will be mandatory to use CFLs (20W maximum) at each of the 2 No. lighting points allowed at each consumer tube well kothas w.e.f. 15.4.2008.)

### 3.2.3 WORK IN COOPERATION WITH USAID/IRG

USAID under its ECO-III project has selected Punjab state in 2007 for assistance to develop state level energy efficiency program – draft five year ECAP and make concerted efforts for enhancing energy efficiency in the buildings and SME sectors.

### 3.2.4 WORK IN COOPERATION WITH ADEME, FRANCE

ADEME, France, is helping the state to establish Energy Information Centers (EIC). Two experimental EIC will be set up in the state of Punjab during the 2008-09, one at PEDDA office Complex, Chandigarh and another at Community Polytechnic, Palahi, near Phagwara, Distt: Kapurthala.

### 3.2.5 INDUSTRY

- Data Bank created for 678 industries with connected load of 500KW or more.
- Energy audit got conducted in 60 industries indicating total annual energy saving potential of 44.2MU approx.
- 15 nos. Designated Consumers have been identified in the state have been requested to appoint Energy Managers and submit annual energy reports.
- Under USAID ECO-III project the following three industries (SME) in each sector have been selected for conducting pilot studies leading to the implementation of the identified energy conservation measures

#### **Steel Re-Rolling Mills at Mandi Gobindgarh.**

- a) M/s. Bhushan Steel Industries
- b) M/s. R.K. Plate & Re-Rolling Mills
- c) M/s. Thakur Steel & Agro Industries

#### **Textile Industries at Ludhiana**

- d) M/s. Ekta Dyeing
- e) M/s. Adinath Dyeing & Finishing
- f) M/s. Davinder Sandhu Ipex Limited

### 3.2.6 BUILDINGS

- a) Energy audit conducted in three State Govt. headquarter buildings for adoption of energy efficiency measures viz. PSEB Head office, Patiala, PUDA Bhawan, Mohali and MARKFED House, Chandigarh.
- b) State govt. buildings such as District level mini secretariat, hospitals, universities, municipal corporation/committee offices, other important buildings were identified for adopting energy conservation measures.
- c) The energy data of 55 nos. buildings collected having approx. total potential of 49 lakh units per annum and the concerned departments have been asked to adopt energy efficiency measures. The following five buildings have been selected for the pilot project.
  - Punjab Mini Secretariat, Sector-9, Chandigarh
  - District Administrative Complex, Patiala

- District Administrative Complex, Sangrur
  - District Administrative Complex, Ludhiana
  - District Administrative Complex, Bathinda
- d) State level meeting with senior officers of Punjab PWD B&R (Electrical) organized in order to sensitize them for adopting energy conservation measures in govt. buildings in the state through ESCO route.

### 3.2.7 ENERGY CONSERVATION BUILDING CODE (ECBC)

- a) Energy Conservation Building Code (ECBC) has been launched on 27.5.2007 by Bureau of Energy Efficiency, Ministry of Power, Govt. of India and it has been circulated to all concerned departments of Punjab for its implementation on voluntary basis.
- b) State level ECBC awareness workshop organized at CII, Chandigarh on 4th December, 2007 under USAID/IRG ECO-III project.

### 3.2.8 LIGHTING

- a) 8000 Street lights have been changed with energy efficient lights in Municipal corporation area of Amritsar through the route of ESCO.
- b) Meeting held with Principal Secretary, Local Govt. Punjab for replacing street lights with energy efficient lights in the Municipal Corporations and Municipal Committees in the state. Director, Local Govt. has been requested to get the energy data compile and send to PEDDA to formulate composite efficiency project.
- c) PSEB is in the process of procurement of energy efficient lights to replace existing lighting fixtures in all their offices, guest houses, colonies and thermal power station.
- d) Agriculture pumping consumers have been directed to replace bulbs with 20 watt CFL by 31.1.2008, the date extended unto 15.4.2008.

### 3.2.9 MASS AWARENESS ACTIVITIES

- a) Energy Conservation awareness campaign launched in 250 schools / colleges by imparting lectures through our field staff and displaying energy conservation tips.
- b) Distt. Level painting competition organized in the schools for class 4th and 5th on energy conservation in the month of September. 50 paintings were selected for state level competition from which 3 were selected for national level competition.
- c) Continuous mass awareness being created among the people through display of Mobile Exhibition Van / Battery Operated Vehicle
- d) 100,000 book stickers carrying message of energy conservation and use of renewable energy distributed in the schools in all the districts.

### 3.3 CONTRIBUTION OF OTHER AGENCIES

Quite another key agency active in the domain of energy conservation are listed in the following tabulation:

<b>Sector /organization</b>	<b>Activities</b>
Punjab State Electricity Board ( public)	Closely working with PEDDA and other government departments in advisory capacity for energy efficiency and DSM programs besides taking up loss reduction measures, improving efficiency of its own stations and promoting co-generation.
B& R Department , GoP	Energy efficiency in establishments
Municipal Corporations /Local Govt department, GoP	Reducing electricity in Public street lighting
National Institute for Secondary Steel Technology	Advisory services and training to Steel Industry (SMEs)
Winrock International- PCRA	Implementing energy efficiency in SMEs ( forging units – Ludhiana)
Ludhiana Hand Tools and Forging Envirocare Pvt Ltd,	Special purpose vehicles for aggregating Carbon credits in 300 hand forging units in Ludhiana
SIDBI	Financing SMEs for energy efficiency and other projects
SBI	Financing SMEs for energy efficiency and other projects
CII-L. M. Thapar Centre for Competitiveness	Training industrial personnel including energy managers/auditors

## 4 ENERGY CONSERVATION ACTION PLAN: PROGRAM OVERVIEW

The Energy Conservation Action Plan and its specific activities are described in detail in a separate document which has been prepared by PEDDA with the assistance of ECO-III project. Here we describe how these activities can be organized into programs and tasks for transfer to the direction of a lead agency or individual for implementation purposes. We also integrate, within the BEE deliverables, activities which the ECO-III program is supporting in the State which are aligned with the ECAP objectives. The three initial planning tools, described earlier in the introduction, can be referred to here along our descriptions of these programs and tasks. Annex A provides a detailed listing and description of the tasks and activities, including deliverables. Annex B provides a discussion of stakeholders and partners, their current activities and potential roles in implementing the ECAP should they be willing to do so.

### PROGRAM A: REDUCTION OF ENERGY CONSUMPTION IN MAJOR SECTORS

## **BEE Deliverable 21: Implementation of EC Act in the State**

### **Task A1: Large Consumers and Textile Industry**

#### **Objective:**

Achieve 3-5% improvement in energy efficiency in 20-30 large consumers notified by GoI in next 3 years

#### **Key Activities:**

- Workshop with inputs from BEE, ECAT and other agencies seeking commitment for the notified consumers to reduce their specific energy consumption and contribute to monitoring of energy savings leading to issuance of white certificates .
- Adding 10 major energy users- food processing, Chemicals & Ceramics to the designated consumers program voluntarily.
- Convert and showcase pilot projects in the designated consumers into information/ dissemination tool for use by PEDDA.
- Support three industries in the following in the sub-sectors: a) Cement, b) fertilizer, c) power plants, d) textiles, e) others, e.g. fertilizer/Chlor alkali, iron and steel /railways for drafting model energy performance contract

**Estimated Budget:** Rs 60 lakhs (part support from the State budget)

### **Task A2: Small and Medium Enterprises**

Objective: Achieve 15-20% improvement in energy efficiency in about 50 SME units in 5 industrial clusters in next 3 years

#### **Key Activities:**

- a) Organize a SME summit with inputs from BEE, ECAT and other agencies to promote energy efficiency in Punjab SME Clusters, MoUs with 50 units; and develop a blue print for the program jointly with Deptt of Industries
- b) Preparation of three guides on "Cost-Effective Energy Efficient Technologies for SMEs" and "Preparation of Bankable EE Proposals for SMEs" and "success stories of SME sector with contributions of the product vendors, energy auditors/facilitators.

#### **Expected budget:**

Rs. 100 lacs (part support from the State budget)

### **Task A3: Municipalities and Urban and Local Bodies**

#### **Objective:**

Implement EE Activities in five major municipalities with efficiency improvements of at least 20%, particularly in the Street lighting sector

**Key Activities:**

- Collect information on energy consumption in Street lighting and water pumping sector
- Implement best practices of EE measures in street lighting and water pumping through energy audits and ESCO interventions
- Organize series of workshops with MCs for major areas such as public lighting, water pumping, sewage disposal, etc.
- Hard sell the concepts of verification of energy savings by the municipalities / energy auditors building upon the work already done

**Expected budget:**

Rs. 150 lacs (part support from the State budget)

**Task A5: Public Buildings**

**Objective:** Apply benchmarking standards to help make government buildings energy efficient by investment grade audits in at least 40 large buildings

**Key Activities:**

- Bench marking of energy consumption in existing Public and Private buildings in Carry out investment grade audits in 40 large buildings (university , commercial complexes, data centers, hospitals, public offices)
- Develop and implement program to make all new buildings in ECBC compliant
- Improve public procurement in existing Public buildings

**Expected budget:**

Rs. 150 lacs (part support from the State budget)

**PROGRAM B: CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING**

**Task B1: Public Awareness, Outreach & Knowledge Sharing**

**Goal:** Create demand for energy efficient appliances, technologies and programs by educating the public and private sector on their options.

**Key Activities:**

- Meetings to raise awareness among the designated consumers and all key stake holders through an effective publicity campaign and state EC Award Scheme
- Conferences to exchange of experiences for implementation of EC Act
- Public Awareness Program for targeted Stakeholders: Certified Energy Managers, Accredited Energy Auditors, Designated Consumers and General Public
- A review of out-reach activities covering consumers, professionals, PEDAs and other Government staff , utilities and several interests including school children in the state to make a media plan in harmony with new activities being envisioned for better synergy , results and mileage
- Seeking an outside Media agency to facilitate Media activities

- Dissemination of Best Practices - major energy users, energy consulting firms Garner support from BEE, state as well as other agencies including beneficiaries for EC campaign making them equal partners in the endeavor to create energy consciousness
- To introduce a State EC Award Scheme

**Expected budget:**

Rs. 150 lacs (part support from the State budget)

**Task B2: PEDDA Capacity Building**

**Goal:** Improve the capacity of PEDDA staff in communications/coordination protocol, procedures between PEDDA, BEE & Stakeholders through a Establishment of Internet platform for communications with SDAs

**Key Activities:**

- Prepare set of forms concerning communication of data and other information with BEE
- Establish systems and procedures for mandatory energy audit reports/action taken reports
- Develop Coordination Protocol with BEE, State Govt, Central Govt and Other Stakeholders
- Establish Energy Information Centers (EIC) within the state with the support of ADEME
- Analyze incentive/disincentives for EE in Punjab
- Review State EC policies and develop recommendations to streamline regulatory role of PEDDA

**Expected budget:**

Rs. 100 lacs (part support from the State budget)

**Task B3: Stakeholders Capacity Building**

**Goal:**

Education and training of the key stake holders – energy managers and energy auditors on implementation of EC measures, e- filing on annual reporting energy data and e-learning in consonance with BEE's mission on the EC Act.

**Key Activities:**

- Increase capacity of designated consumers to report effectively on energy data by training of designated consumers for annual reporting of energy data
- Refresher courses for energy managers and auditors and candidates appearing in BEE examinations
- Implementing Life Long Learning Program for energy professionals

**Expected budget:**

Rs. 50 lacs (part support from the State budget)

## 5 STRENGTHENING EE FUNCTION AT PEDA:

### 5.1 PEDA ORGANIZATIONAL TRANSITION

In order to integrate its new responsibilities and develop adequately the organizational structure to support these, PEDA will need to add a new unit: “Energy Efficiency Unit”. This unit we anticipate will require the staffing for the next 3 years.

- a) Senior Manager for EC Act related activities
- b) Senior Manager for SME related activities
- c) Senior Manager for Buildings and municipalities activities
- d) Senior manager for promoting standards and labeling and demand side management activities
- e) Senior manager for Out-reach & training activities

As activities expand, it is expected that staffing requirements will increase by 20 % per annum.

Director PEDA may continue to look after functions such as EE Financing, policy studies and monitoring & evaluation of EE programs.

Additional budgetary implications for remuneration, infrastructure, support staff and logistics are estimated to be Rs. 50 lakhs per annum.

### 5.2 PEDA STRENGTHS

PEDA has been active and initiated some ECAP steps:

- RE/EE Educational Programs in Schools & Public
- RE/EE Awareness Programs
- Created EC Action Team
- Actively engaged in developing and executing annual ECAP for implementation of the EC Act for the past one year or so
- Closely tracking the response of the stake holders for better result oriented strategies
- 

PEDA will also need significant capacity building to accomplish benefits from the ECAP on a continuing basis:

- Program management, oversight, coordination and finance and administration skills
- Database development, data collection, benchmarking and reporting
- Understanding and enforcing EE Codes and Standards
- Policy review, analysis and recommendations
- Finance mechanisms
- Manage capacity building of Key Implementing Partners
- 

The chief executive and Director (PEDA) may continue to involve deeply the ECAT, implementing partners and seek need based outside professional support.

## 6 BUDGET

The road map has delineated a few crucial activities related to EC Act seeking involvement and contributions from various quarters including BEE, user organizations/ beneficiaries (as they benefit straight away) and the state Government. It is envisaged that contribution of the state Government to these programmatic activities may be pegged to at least Rs. 760 lacs in the eleventh five year period. Substantive efforts are also needed for garnering support from other donor agencies including BEE. This excludes the budgetary support for staff as indicated at 5.1 above.

## 7 MONITORING AND EVALUATION PLAN

PEDA is accountable for overall reporting on implementation progress, preparation of financial monitoring reports, and preparation of audited project accounts. Monitoring and evaluation will also reflect the specific monitoring plan for Verifiable energy savings as a result of the major key initiatives in the state – designated consumers, SMEs, buildings and municipalities .

PEDA is collaborating with BEE and fast learning the Reporting requirements. In the long run, these requirements will integrate with Energy Information Center and BEENET in the offing. In this context, PEDA may like to engage an independent agency to assess the efficacy of the initiatives being contemplated by them.

All key activities leading to verifiable energy savings can be adjudged for their efficacy by the certified savings. Efforts in this regard are at the nascent stage; it is likely that PEDA will put in serious efforts to assess the impact of key deliverables with the assistance of specialist agencies.

## 8 CONCLUDING REMARKS

IRG is appreciative of the close cooperation received from Punjab counterparts and looking forward to assist PEDA in the implementation of its Action Plan and, concurrently, incorporate other ECO-III activities as appropriate to complement ECAP work and ensure an integrated approach

**INTEGRATED OBJECTIVES AND ACTIVITIES-PEDA ENERGY CONSERVATION ACITON PLAN**

**Annex-A**

**Program A – Reduction in Energy Consumption in Major State Sectors**

Tasks		Activities		Deliverables	Implementing Partners
A1	Large Consumers and Textile Industry	A1.1	Develop pilot program to implement EE technologies in 5 - 10 industries in Punjab (cement, fertilizer, power, chlor alkali, railways, textile, etc)	a) Workshop with inputs from BEE, ECAT and other agencies seeking commitment for the notified consumers; b) Roadmap for the White Certificate program (linking government incentive)	GoP: PEDA, Industries department , BEE, Ibilt, Future Computing Solution (I) Pvt. Ltd., Mohali, Private Sector: Energy Auditors and ESCOs/Consulting firms, Designated Consumers NGOs: NPC, CII
		A1.2	Develop plan to add more large energy intensive units the ECAP program	10 major energy users- food processing, Chemicals & Ceramics, may be chosen voluntarily.	PEDA, BEE, Ibilt , NGOs/ agencies to support PEDA , utilities, Future Computing Solution (I) Pvt. Ltd., Mohali
		A1.3	Convert and showcase pilot projects into information/dissemination tool for use by PEDA	Five case studies with lessons learned etc for A1 for the task as whole Contribute materials to Del 16, annual yearbook of energy conservation measures.	PEDA, energy consulting firms , energy managers , CII-center for competitiveness
A2	Increase EE in SMEs	A2.1	Survey and selection strategy for invited industrial units to participate in EE program	a) Organize a SME summit with inputs from BEE, ECAT and other agencies to promote energy efficiency in Punjab SME Clusters, MoUs with 50 units; b) PEDA develops a blue print for the program jointly with Deptt of Industries c) Semi-annual reporting of the achievements to the BEE .	GoP: PEDA, BEE Private Sector: Energy Auditors and ESCOs/Consulting firms, SME Industry Associations, Product/Technology vendors, Financial institutions NGOs: NPC, CII, Ludhiana Hand Tools and Forging Envirocare Pvt Ltd, NISST,

		A2.2	Document Best Practices in the selected clusters	Preparation of three guides on "Cost-Effective Energy Efficient Technologies for SMEs" and "Preparation of Bankable EE Proposals for SMEs" and "success stories of SME sector with contributions of the product vendors, energy auditors/facilitators.	PEDA, energy consulting firms , energy managers
A3	Municipal Best Practices for EE	A3.1	Plan and execute EC activities in 5 major municipalities and ULBs in the field of street-lighting, water pumping and sewage treatment	a) MoUs with ESCOs and MCs/ULBs to implement EE programs. b) Capacity building and awareness workshop for the engineering and management staff-MCs, ULBs, Consulting firms, ESCOs, equipment suppliers, etc. in the field of performance contracting, monitoring and verification.	GoP: Local Govt. Deptt, Municipal Corporations, ULBs, PEDAs. Private Sector: Energy Auditors and ESCOs ,
		A3.2	Develop public sector energy-efficient procurement program focusing on energy-efficient street lights and fixtures, energy-efficient pumps.	Develop minimum EE specifications for municipalities, working closely with BEE's Star Labeling Program, that MUST be met in all government procurement and a Government Order/Regulation issued making it mandatory.	GoP, ECO-III Project
A4	Government Buildings in Punjab	A4.1	Develop first commercial building benchmarking framework in the country using energy audit data already compiled by GoP agencies	Report documenting the process followed, lessons learned to be used in other projects, and quantification of energy and carbon savings using IPMVP methodologies.	GoP Organizations: PEDAs, UDD, , B& R Deptt, Ministry of Health, PSEB, Private Sector Partners: Architecture and Consulting Firms, Approved Energy Auditors, ESCOs

		A4.2	Develop an energy-efficient procurement program focusing on fluorescent tube-lights, compact fluorescent lamps, ceiling fans, room air-conditioners, and water pumps.	Working closely with BEE's Star Labeling Program, develop minimum energy efficiency performance specifications that MUST be met in all government procurement and a Government Order/Regulation issued making it mandatory.	GoP Organizations: PEDAs, UDD, B& R Deptt, Ministry of Health, PSEB,
		A4.3	ECBC Compliance program for new buildings; minor retrofits in existing buildings	ECBC User Guide and Tip Sheets (HVAC, Lighting, Envelope), Compliance Check-lists to help design ECBC compliant buildings; 5 ECBC compliant government buildings	UDD Deptt, PEDAs, PSEB, Architecture and Consulting Firms,
		A4.4	Develop and implement an energy-efficient program (energy audits followed by project implementation) in partnership with the private sector consisting of 20 Govt. buildings	Executed contracts to perform energy efficiency projects in 20 government buildings; Investment grade audits in 20 large government buildings	GoP Organizations: PEDAs, UDD, B& R Deptt, Ministry of Health, PSEB,
A5	Support to PEDAs in EE Policy Development	A6.1	Develop market transforming government policies from specific activities (A1 through A5) as envisioned in this document. Examples are: 1) Government resolutions on Energy Efficient Procurement with a list of products to be covered supported by performance specifications [EE Procurement Under Federal Energy Management Program] 2) Government resolution directing all new government buildings to be ECBC-compliant and to reduce energy intensity by 10% in the next three years through EE procurement and performance contracting.	Policy documents (e.g. Government Resolutions) outlining the schemes in full detail to enable quick and effective policy implementation by concerned departments.	GOP: PEDAs, Deptt. of Urban Development, BEE International Partners: FEMP, PEPS-India, EPA, LBNL, DOE

**Program B – Implementation of Activities to Support BEE Deliverables**

B1	Public Awareness, Outreach and Knowledge Sharing	B1.1	Raise awareness among the designated consumers and all key stake holders through an effective publicity campaign and state EC Award Scheme	Semi-annual State level meeting with certified energy managers and accredited energy auditors to discuss duties and responsibilities as well as review the progress (5); Annual State level conference of energy intensive industry, as well as certified energy managers and accredited energy auditors (6)	PEDA, BEE, Ibilt , NGOs/ agencies to support PEDTA , utilities,
		B1.2	Exchange of ideas and additional ideas for implementing EC measures	Half yearly meeting for exchange of information about lessons learned on State level implementation of EC Act (7)	GoP officials, vendors of energy efficiency equipment, energy consulting firms, private sector agencies
		B1.3	Public Awareness Program for targeted Stakeholders: Certified Energy Managers, Accredited Energy Auditors, Designated Consumers and General Public	Design and printing of promotional material to be distributed to all four stakeholders: certified energy managers, accredited energy auditors, designated consumers and general public (9)	PEDA, PSEB , NGOs- TERI, CII
		B1.4	Dissemination of Best Practices - major energy users, energy consulting firms	State EC Award Scheme	NGOs- TERI , CII

B2	PEDA Capacity Building	B2.1	Develop communications/coordination protocol, procedures between PEDA, BEE & Stakeholders	Establishment of Internet platform for communications with SDA (1); Prepare set of forms concerning communication of data and other information with BEE (4); Establish systems and procedures for mandatory energy audit reports/action taken reports (21); Develop Coordination Protocol with BEE, State Gov, Central Gov and Other Stakeholders (22)	PEDA,Future Computing Solution (I) Pvt. Ltd., Mohali, ibilt, Ademe,
		B2.2	Develop information and tracking systems to support EE activities and collect EE data for appropriate monitoring of progress of EC Act	Preparation of list of certified energy managers and accredited energy auditors which work or reside in the State (ESCOs) (2); Preparation of list of designated consumers and their energy consumption (3); Collection of data concerning manufacturing as well as sales of household appliances and other equip at State level falling under the EC Act (13); Annual report on State wise sales of labeled household appliances and other energy intensive equipment (14); Survey of buildings at State level which fall under EC Act (17)	PEDA,Future Computing Solution (I) Pvt. Ltd., Mohali, ibuilt, Ademe,

		B2.3	Collect lessons learned and analyze impact	Participate in annual meeting of all SDAs to discuss progress and next year's action plan with BEE (8); Annual survey and analysis of impact of EC Act based on reports of accredited energy auditors as well as energy managers and other sources of information in the State(15)	PEDA,Future Computing Solution (I) Pvt. Ltd., Mohali, Ibilt, Ademe,TERI
		B2.4	Analyze incentive/disincentives for EE in Punjab	Prepare report based on analysis of State level incentive and disincentive policies concerning energy conservation measures in energy intensive industries including power sector (18)	PEDA,Future Computing Solution (I) Pvt. Ltd., Mohali. Ibilt,
		B2.5	Review State EC policies and develop recommendations to streamline regulatory role of PEDDA (19)	Report on recommendations for streamlining State policies on EE (19); Prepare draft rules and regulations under EC Act for the State (21)	PEDA, Future Computing Solution (I) Pvt. Ltd., Mohali, TERI, NGOs- NPC, TERI
B3	Stakeholders Capacity Building	B2.6	Increase capacity of designated consumers to report effectively on energy data	Training of designated consumers for annual reporting of energy data (12)	PEDA, BEE, ibilt , NPC
		B2.7	Strengthen capacity of EAs and Energy Managers	EA & Energy Managers Refresher courses (10)	PEDA, NPC, CII-Thapar center for competitiveness
		B2.8	Implement Life Long Learning Program	Implementation and conduct of Life Long Learning (3L) Program of BEE for CEAs and CEMs and other interested parties (11)	PEDA, NPC,CII-Thapar center for competitiveness , TERI

**Annex – B**  
**Partner’s Role for Implementing Energy Conservation Action Plan**

Key Partners	On-Going Past and Present Relevant Programs	Proposed Role in ECAP
<b>Task A1: Reduction of Energy Consumption in Designated Consumers and Textile Industry</b>		
IBUILT – Implementing Partner	◆ Listing and Survey of Designated consumers, energy audits, promotional programs	◆ Co-ordinate with PEDA ,BEE and stake holders such as energy managers and auditors
PSEB	◆ Drawing a blue print for energy efficiency in its power stations	◆ Co-ordinate with PEDA ,BEE and stake holders such as energy managers and auditors
NITRA (Research Organization)	○ Reputed research organizations with an excellent understanding of excellent EE opportunities and other related issues in the textile sector	◆ Guide energy managers/auditors for implementing EE measures, provide training to energy managers and auditors, develop analytical tools to help identify and implement EE measures in the textile sector.
<b>Task A2: Reduction of Energy Consumption in Small and Medium Enterprises</b>		
Department of industries , GoP	◆ Special Studies	◆ Jointly take up with PEDA innovative schemes to improve energy efficiency in the selected clusters by networking with industry associations, equipment suppliers, banks and energy audit firms.
Industry Associations , NGOs ( TERI , Winrock , NPC , PCRA , NISST ) (Implementers)	◆ Implemented energy audits studies, workshops ,and other catalytic activities;	◆ Participatory studies in the clusters involving equipment suppliers and Banks; ◆ PEDA can partner with these organizations in carrying out awareness and training programs, identifying appropriate technology and associated vendors to promote EE in different SME clusters.
Banks- State Bank Of India/ SIDBI/ Punjab National Bank /Yes Bank	◆ SBI implemented SBI Uptech Scheme- Other Banks usually finance on the merit of the Project and credit worthiness of the SME unit Projects – EE activities usually tied to plant modernization and expansion of operations are preferred	◆ Promote implementation of energy efficient technologies in SME clusters tied to Project finance. At the moment
<b>Task A3: Municipal EE Best Practices</b>		
Department of Local Government	◆ Mandate to implement EE projects in MCs and urban and local bodies; ◆	◆ Promoting EE best practices in MCs and ULBs through ESCOs, promotional measures; ◆

Key Partners	On-Going Past and Present Relevant Programs	Proposed Role in ECAP
Econoler International , Canada	◆ Technical assistance for implementing energy efficiency and CDM Projects in street lighting	◆ Co-ordinate jointly with PEDDA in seeding energy performance contracting
<b>Task A4: EE in Buildings – Existing and New Construction</b>		
B& R Department, GoP	◆ Pilot projects to improve energy efficiency in mini Secretariat and DAC Buildings and other Govt buildings ◆ Pilot project to improve street lighting in Gandhinagar;	◆ Co- partner with PEDDA in optimizing energy consumption and costs, energy bench marking , implementing case studies, user department involvement in curbing energy use
Energy Services Companies (Implementers)	◆ Conduct many good quality energy audits in public sector buildings (hospitals and govt. buildings); ◆ Ability to implement large-scale ESCO projects;	◆ Can help PEDDA in providing valuable industry feedback on the challenges and barriers faced by the industry;
Equipment Suppliers –efficient lighting, refrigerators, window air conditioners, fans	◆ Participate in national efforts for Standards & Labeling Programs	◆ Participate as a Vendor ESCO for replacing inefficient electrical appliances by efficient/ 4 or 5 star labeled products
<b>Task A5: Support to BEE's Utility Driven DSM Program at the State Level</b>		
Punjab State Electricity Board	◆ DSM Cell has been operational for many years; Some pilot projects have been implemented	◆ Agricultural pump efficiency program for submersible pump sets and other EC measures such as use of CFLs, , drip irrigation ; partner with PEDDA in pushing EE activities in all major consumer sectors ..
<b>Task A6: Support to PEDDA for EE Policy Development</b>		
Future Computing Solution (I) Pvt. Ltd., Mohali , Ademe , NPC /TERI	◆ ECAP & deliverables identified by BEE	◆ ,Providing a framework to develop detailed plan for selected areas jointly with PEDDA and other stake holders
TERI , Future Computing Solution (I) Pvt. Ltd., Mohali	◆ Special studies	◆ Implementing new programs by taking up special studies on topical themes deploying analytical models
<b>Task B1: Public Awareness, Outreach &amp; Knowledge Sharing (Best Practices, Promotion of EE, S&amp;L, Codes, etc)</b>		
ibilt Technology Ltd.,New Delhi, CII- I.M.Thapar center for competitiveness / Punjab university, NGOs ,	◆ Media campaigns , State EC campaigns , EC award schemes	◆ assist implementing energy efficiency measures, promotional leaflets, case studies, Implement jointly with PEDDA an Energy Efficiency Award
	◆ seminars- events related to energy efficiency	◆ scheme for municipalities /Municipal staff

Key Partners	On-Going Past and Present Relevant Programs	Proposed Role in ECAP
<b>Task B2: PEDTA Capacity Building</b>		
ibilt Technology Ltd.,New Delhi , CII- I.M.Thapar center for competitiveness / Punjab university, National Productivity Council/TERI , Future Computing Solution (I) Pvt. Ltd.,	◆ ECAP- review and additional activities,	◆ Need based support in taking up activities related to BEE 22 deliverables , review workshops on Programmatic activities
<b>Task B3 Stakeholders Capacity Building</b>		
CII- I.M.Thapar center for competitiveness / Punjab university, National Productivity Council/TERI	◆ Training energy managers .auditors	◆ Offering courses for energy managers and auditors life long learning and refresher programs for energy professionals