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ESTABLISHMENT OF REGIONAL ENERGY EFFICIENCY CENTRES

UNDER USAID ECO-III PROJECT

TECHNICAL REPORT

September 2008
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Appendices

1. BACKGROUND

In light of the Energy Conservation Act 2001 and existing government policies and initiatives, USAID funded ECO-III Project plans to support setting up a few Regional Energy Efficiency Centers (REECs) in India. Major objectives envisaged for the establishment of REECs are as follows:

- Enhance energy efficiency awareness and education among energy end-users
- Facilitate showcasing and demonstration of energy efficient products for public at large
- Promote development (incubation) of energy efficient technologies
- Encourage research and interdisciplinary collaboration on energy efficiency
- Catalyze the development and growth of energy efficiency market and business in the country.

Each REEC is expected to be established in an existing institution or organization but is intended to function on a sustainable business model with a long-term operational plan. On the basis of merits of the proposal from the willing Host Institution/Organization, the start-up funds and technical assistance (TA) from an appropriate US institution could be provided through USAID and other resources. However, in the longer run, the REEC is expected to diversify its funding sources, receiving funds from multiple origins, and generate its own revenue in an effort to become self-sustaining. The initial and ongoing funding for REEC could be secured by the Host Institution through public-private partnership such as the State government, private or state owned electric utilities, industry, foundations, other aid agencies, etc.

Each REEC is planned to be well focused in carrying out its identified functions but also needs to be flexible enough to develop collaborative models with academia, energy efficiency service providers, financial institutions, energy-efficient equipment vendors, industry associations, etc. The administrative set-up for REECs is likely to be oriented so as to keep in view the identified objectives of the REEC, its funding sources, its target group, and a host of other factors considered important for the functioning of the REEC.

2. PROCESS FOLLOWED FOR ESTABLISHING REECs

2.1 IDENTIFICATION OF THEMES FOR REECs

As follow up on the deliberations in the workshop organized by USAID in partnership with Bureau of Energy Efficiency (BEE) in January 2007 (Refer to Report of the Workshop, Appendix A) and subsequent meeting with BEE on March 30, 2007 (Refer to Minutes of the Meeting, Appendix B), the following eight potential themes were identified for the establishment of REECs:

- Energy Efficient Domestic Appliances
- Energy Efficient Motors
- Energy Efficient Pumps
- Energy Efficient Lighting
- Energy Efficient Envelope and Building Energy Simulation
- Energy Efficient HVAC and Energy Management Control Systems
- Energy Loss Detection/Diagnostic Technologies
- Energy Efficiency in Industries

2.2 REQUESTS FOR PROPOSALS

ECO-III prepared a Concept Note on REECs (Appendix C) in consultation with USAID to seek proposals from various organizations. The Concept Note included the recommended structure of the proposal and evaluation criteria for assessing the proposal. On the advice of USAID, the Concept Note was sent to the following nine potential organizations, which had earlier shown keen interest to USAID in promoting energy efficiency in the country:

No.	Organization/ Institution	Theme
1	West Bengal Renewable Energy Development Agency (WBREDA), Kolkata	Energy Efficiency in Domestic Appliances
2	Nonferrous Materials Technology Development Center (NFTDC), Hyderabad	Energy Efficiency in Electric Motors
3	Punjab Energy Development Agency (PEDA), Chandigarh	Energy Efficiency in Agriculture Pumps
4	Indian Society of Lighting Engineers, Noida	Energy Efficiency in Lighting
5	Electric Lamp & Component Manufacturing Association, (ELCOMA), Delhi	
6	Karnataka Power Trading Corporation (KPTC), Bangalore	
7	Center for Environmental Planning and Technology (CEPT), Ahmedabad	Energy Efficiency in Buildings and Energy Simulation
8	SECO Control, Chennai	Energy Loss Detection and Diagnostic Technologies
9	SEE-Tech Solutions Pvt. Ltd. (SEE-Tech), Nagpur	Industrial Energy Efficiency

2.3 EVALUATION OF PROPOSALS

ECO-III received proposals from six organizations – NFTDC, CEPT, WBREDA, ELCOMA (in association with ISLE), SEE-Tech, and SECO – for establishing REECs. Appendix D provides the salient features of the proposals. ECO-III did not receive proposals from PEDA and KPTC.

USAID constituted an Evaluation Committee (Appendix E) and invited the Committee Members for the evaluation of the proposals received from the six organizations.

- All the six organizations were invited for presenting their proposals to the Evaluation Committee in ECO-III Project Office on January 30, 2008. The proposed evaluation criteria and their weighting factors proposed in the Concept Note were accepted by the Committee. To strengthen the evaluation process, additional guidelines (Appendix F), prepared by ECO-III, were also provided to the Committee Members.

- All the organizations made PowerPoint presentations before the Committee. On the basis of the same and subsequent discussions, the Members independently highlighted their main observations and recommendations. The General conclusions of the Evaluation Committee were as under:

General conclusions of the Evaluation Committee

- Proposal from CEPT was rated very high, considering its commitment to promote Energy Conservation Building Code (ECBC) implementation, addressing the priority area of energy efficiency in buildings, intent of development of testing facilities of glazing products, strong institutional support from the University, past experience of working with international agencies, etc. CEPT, however, needs to identify its specific support requirement from the Project.

- SEE-Tech proposal was also ranked high for support. Strong points of the proposal are: institution's ongoing activities, such as providing training to industries using software applications and practical demonstration of energy efficiency techniques and practices through lab scale models, strong commitment to promote energy efficiency in small- and medium-sized enterprises (SMEs), investment already made on land and building that would support hosting of REEC, etc. The institution was asked to focus its efforts exclusively on industrial furnaces, specifically looking into the requirements of SMEs.

- WBREDA proposal was also well appreciated due its emphasis on creating State-wide efficiency awareness on domestic appliances, creation of a state-wide network of technical institutions, which are already in place, ongoing construction of building to house REEC, ability to get additional support from the State Government, etc. It was also mentioned that WBREDA should leverage ECO-III Project's support with US Department of Energy's offer of assistance in structuring programs and activities for the Center.

- NFTDC was considered a strong institution that has been dealing with the issue of energy efficiency of electric motors with support from a number of international agencies including a grant from Global Environmental Facility and support from International Copper

Association. The institution plans to strengthen its motor-testing facilities, which requires substantial funding. It has good technical resources and expertise on the subject but it needs to enhance its linkages with motor end-user sectors and develop stronger partnerships with existing institutions to leverage their competence.

- Combined proposal from ELCOMA and ISLE highlighted a good long-term vision of promoting lighting efficiency. It was noticed that despite willingness and expected substantial support from the members of the Association (mostly large companies manufacturing lamps) not much has happened in establishing a lighting excellence center. The proposal stressed the need for getting land and building for REEC as aid under the Project, which was not supported by the Committee. However, ELCOMA/ISLE was asked to identify and inform their specific requirements to the Project.

- SECO proposal was evaluated as a package of good ideas and vision to apply newer technologies to promote local renewable energy resources efficiently in rural areas. The Committee pointed out that the Institution at present is not equipped to establish REEC.

- On the basis of Evaluation Committee Recommendation, USAID short-listed four institutions - CEPT, WEBREDA, SEE-Tech, and NFTDC, for possible support for hosting REECs.

2.4 POST EVALUATION ASSESSMENT

Based on the recommendations of the Evaluation Committee, on February 29, 2008 USAID informed the four short-listed organizations – namely CEPT, WEBREDA, SEE-Tech, and NFTDC – of the need for additional information for establishing REECs. In this context, a team consisting of USAID (Dr. Archana Walia, CTO) and ECO-III (Dr. Satish Kumar/Ravi Kapoor) visited all four organizations and made further assessment of their proposals and the organizations. USAID and ECO-III also held a meeting with BEE on May 21, 2008 and presented the status of REECs. On the basis of visits and subsequent communication with the organizations, ECO-III developed individual profiles of four REECs organizations (Appendices G to J).

Considering the availability of financial resources, USAID has agreed to support three organizations - CEPT, WBREDA and SEE TECH, to establish REECs under ECO-III and APP initiatives. USAID has observed that NFTDC was also favorably evaluated during the evaluation exercise, as a potential REEC. However, due to limitation of funds, the decision to support NFTDC has to be deferred until additional funds are made available to the ECO-III Project. USAID has asked IRG to take necessary actions to support CEPT, WBREDA, and SEE TECH for establishing the Centers in their respective organization.

2.5 DEVELOPMENTS AND MILESTONES OF REEC ACTIVITIES

Date	Development and Milestone
January 25, 2007	USAID organizes a workshop in Delhi on "Regional Centers for Energy Efficiency"
March 30, 2007	BEE – USAID Meeting on REEC Preparatory Plan
July 23, 2007	ECO-III sends Background Note to USAID on the establishment of REEC and the framework for seeking proposals from the potential organizations
October 16, 2007	USAID advises ECO-III to send request to nine potential organizations identified by USAID for submission of their proposals on REEC
October 31, 2007	ECO-III requests the identified potential organizations for submission of their proposals on REEC
Nov.– Dec. 2007	ECO-III receives 6 proposals from CEPT, WEBREDA, SEE-Tech, NFTDC, SECO, and ELCOMA-ISLE
January 7, 2008	USAID recommends the constitution of an Evaluation Committee, and fixes 30 January 08 for evaluation of proposals
January 15, 2008	USAID constitutes the Evaluation Committee and invites members to participate in the evaluation process for short listing of organizations
January 30, 2008	Six organizations present their proposals. The Committee evaluates the proposals and provides its recommendations on short-listing of organizations for USAID support for establishing REECs
February 5. 2008	ECO-III prepares the Evaluation Report on the basis of proceedings of the Evaluation and submits it to USAID. USAID approves the report. ECO-III sends the report to the Committee Members.
February 29, 2008	USAID informs four short listed organizations (CEPT, WEBREDA, See-Tech and NFTDC) the need for additional information for establishing REECs
Mar.– May 2008	USAID and ECO-III jointly carry out further assessment of four organizations and review their proposals
May 21, 2008	USAID and ECO-III hold meeting with BEE, and present the status of REECs. BEE gives its suggestions to USAID/ECO-III
June – July 2008	Keeping in view BEE suggestions, ECO-III gathers more information from four organizations, and prepares REEC Profiles of the organizations
July 22, 2008	ECO-III discusses with USAID the profiles of four proposed REECs
July 30, 2008	USAID agrees to support CEPT, WBREDA and See Tech to establish REECs under ECO-III and APP initiatives. USAID also observes that support to NFTDC to be deferred till additional funds are made available to ECO-III

APPENDIX-A

Brainstorming Workshop Report on Regional Centers for Energy Efficiency

Date: 25 January 2007

Venue: India Habitat Center, New Delhi, India

Workshop Organization by

USAID/India

Workshop facilitation by

Development Alternatives

The Context

A one day workshop was held on 25 January 2007 to brainstorm on the subject "Regional Centers for Energy Efficiency" in India. The need/significance of such a brainstorming workshop finds its origin in the US-India Energy Dialogue, launched in May 2005 as part of President Bush and Prime Minister Man Mohan Singh's call for a transformed India-US relationship, premised on a new strategic alliance based on energy security and energy cooperation. The Dialogue was aimed at promoting increased trade and investment in the energy sector by working with the public and private sectors to further identify areas of cooperation and collaboration. Both India and the United States have shared interests in energy security, sustainable energy development, deployment of clean energy technologies and stable energy markets. The US-India Energy Dialogue consists of five Working Groups: Civil Nuclear Energy, Oil and Gas, Coal, New Technology and Renewable Energy, and Power and Energy Efficiency.

Under the aegis of the Power and Energy Efficiency Working Group a conference was held in May 2006 in Delhi on "The US India Energy Efficiency Technology Cooperation". The conference reiterated that a strategic Indo-US partnership in building the capacity to plan and implement energy efficiency will help advance Indian energy security and mitigate the environmental impact of rapid energy growth. In the light of the above, three forces were stressed upon; first, buildings and industrial sectors offer enormous opportunity for increasing energy efficiency; second, potential returns from energy efficiency will become even greater in the future; and, third, the market place rewards sustainable products and business practices.

The United States has a National Energy Policy and the government's top three priorities are to increase the efficiency of buildings and appliances, reduce the energy intensity of industry, and lead by example through the government's own actions. The Indian government has also made tremendous progress in this regard – the National Electricity Policy, the Bureau of Energy, and the Energy Conservation Act 2001. One of the strongest recommendations of the May 2006 conference was the building of six to eight Energy Efficiency Technology Centers across the country in order to ensure adequate energy and affordable supplies while addressing relevant environmental concerns. This workshop was convened to brainstorm on the issue and seek guidance and recommendations from the participants.

Objectives

- To brainstorm the question of Regional Centers for Energy Efficiency
- To examine the existing energy efficiency centers in the United States and the rest of the world as potential models for India
- To initiate the concept design of energy efficiency centers based on sound business models
- To facilitate a discussion between stakeholders regarding the adoption of energy efficient technologies, systems and practices
- To help develop a plan and strategy for solicitation of proposals including criteria for selection and support

Methodology

The methodology adopted was that of structured presentations, followed by a facilitated, open ended discussion.

Deliberations

The starting point of the deliberations is the vision that energy efficiency is a cost effective and environmentally sound component of power and capacity addition strategies. This vision coupled with the mandate provided by the US-India Energy Efficiency Technology Conference of May 2006 that energy efficiency information dissemination to the general public and technical know how to industry and public entities such as government agencies and municipalities were critical issues in developing the Indian energy efficiency markets, were the underlying theme of the workshop. The key means of providing public information and technical know how has been identified as the creation of regional centers of excellence and expertise in energy efficiency. Such centers would serve the strategic purpose of energy efficiency market transformation and services development in India.

Regional Centers of Energy Efficiency provide public education, facilitate demonstrations (showcasing products), promote technology development (incubation), and catalyze energy efficiency market transformation and business growth.

The Government of India is committed to promoting energy security. The National Electricity Policy in its section on energy conservation states "there is a significant potential of energy savings through energy efficiency and demand side management measures. In order to minimize the overall requirement, energy conservation and demand side management (DSM) is being accorded high priority. The Energy Conservation Act has been enacted and the Bureau of Energy Efficiency has been setup". The Ministry of Power, recognizing the importance of regional centers of energy efficiency, has engaged in discussions to consider the proposals of several centers throughout the country. These centers are aimed at enhancing public education on efficient use of energy, sharing best practices among energy end-users, providing technical know-how on energy efficiency solutions, and showcasing a thematic area of energy efficiency specialization.

The key barriers to energy efficiency in India are excessive supply bias, inefficient pricing regimes, lack of energy efficiency service providers, and limited availability of platforms for energy efficiency market and business transformation. The Special Secretary, Ministry of Power, Mr. U. N. Panjiar stressed that the Government of India and the Bureau of Energy Efficiency are committed to eliminating the barriers in order to achieve energy efficiency. In particular, the three aspects that need to be addressed include the training of energy users, the transfer of energy efficient technologies and the increased use of energy efficient technologies.

Energy efficiency centers around the world perform a variety of functions ranging from research (technology research and development; policy, program, and/or market research; market and investment analysis for industry/companies), education (information, education, public awareness; and training – workshops, classes, demonstration), on-site services (technology showcase / exhibition, conferencing / training facilities, application / product testing, hardware tool lending library, information library), and numerous other functions (conduct energy audits, market conditioning – analyze and promote policy reform, provide grants). Many centers have a

broad mandate. They undertake activities not only related to energy efficiency but also on renewable energy, sustainable development, and climate change. However, international experience has shown that centers, which focus on a particular aspect of energy efficiency, have been able to affect a more significant technical impact in their area of focus.

The target audiences or customers of centers include industry, governments and the general public. The target audience and center customers are determined by the objectives and purpose of the center as well as initial and ongoing funding sources. Industry, national governments, aid agencies, and public utilities play a key role in providing funding to centers. Businesses pay a fee to centers to conduct research, provide a venue to showcase products, deliver training, and test products. Centers also provide a variety of services to local, state, and national governments. Centers provide these services both to the government entities themselves and on behalf of the government to other audiences. Common activities include providing training and education, as well as conducting research and performing energy audits. The Centers provide services to the general public by conducting education and outreach programs and providing on-site library services. It is common for centers to undertake activities for a variety of audiences. For example, in Germany, the center audiences / clients are commerce and industry, trade and services sector, housing industry, utilities, policy, and municipalities. In the U.S., centers are run by universities and utilities and play a key role in public education and applied research.

The initial and ongoing funding for energy efficiency centers comes from governments, foundations, aid agencies, public utilities, industry, and various other sources. The start up funds often come from one or two sources but in the longer run the centers tend to diversify their funding sources, receiving funds from multiple sources, in an effort to become self sufficient. The centers in Germany exemplify the public-private partnership model. These centers are for-profit organizations, which combine business interests with national energy efficiency goals by engaging in consultancy services and encouraging energy efficiency investments.

Centers can be administered by a variety of organizations. For the centers reviewed outside the United States, it is common for them to be administered by the country's respective national government, even though they are officially an independent organization. For both centers in the United States and elsewhere, it is also common for the centers to be self-administered, i.e., not attached or run by a larger organization. Instead, they perform their own administrative functions. Furthermore, in the United States, several centers are operated by universities.

It was pointed out that a "center" needs to earn the caption of "center of excellence" and this cannot be bestowed on it – rather it has to be developed through its impeccable performance. Furthermore, it was suggested that the staff of the center play a key role in the development of its brand and the quality of its services.

Conclusion/Recommendations

The Regional Energy Efficiency Centers need to be discussed further in greater detail. There is a need for clarity on several aspects. At the same time, the barriers that can arise in the future must be anticipated and there is a need to be prepared to deal with these possible barriers.

The objectives of the centers should include information sharing and dissemination of knowledge. The centers should aim to become the source of information for all their target audiences as well as the general public including the common man in the remotest village. At the

same time, the centers should aim to become incubation centers for innovation and new technologies. The centers, while focusing on raising the profile of energy efficiency among end-users should focus on academia, energy efficiency service delivery groups, financial institutions, vendors and others. Similarly, along with being Centers of Excellence they must strive to be Centers of Application.

On the question of the model, there is need for clarity on whether the centers are to institutions or business focus centers, and whether they will be single or multi issue focused. However, there is unanimity on the fact that the centers must adopt a sustainable business model.

There was a suggestion that the centers need not be located in specific locations with large capital investments. In this information age, the centers can be run through networks where concerned people are connected to each other.

The question of funding of the centers also needs more consideration. The centers could be financed through equity and significant contributions from the private sector. Banks should also be made a part of the process and must be encouraged to contribute financially.

Need was also felt for trainings on the utilization of the products, the operators of the equipment, and manuals for using equipments. There was a suggestion that the research and development training aspects should be left to the universities.

There are many possible combinations of functions, funding, and institutional arrangements that can be brought together to create the ideal center for a specific location and purpose. International experience has shown that centers can be successfully administered by a variety of organizations. The administrative setup for any one particular center will depend on a combination of considerations including how the center is funded, what the objectives of the center are, and who the target audience of the center is.

In conclusion, the Bureau of Efficiency (BEE) in consultation with USAID and other stakeholders shall endeavor to develop a program strategy and action plan to create regional centers of energy efficiency taking into consideration the views expressed at the brain-storming workshop.

APPENDIX-B

Minutes of USAID-BEE Meeting, 30 March 2007: Regional Energy Efficiency Centers - Preparatory Plans

Meeting Date: March 30th, 2007

Participants: BEE - Dr. Ajay Mathur and Mr. Saurabh Kumar

USAID - Mr. Glen Whaley, Mr. S. Padmanaban, and Dr. Archana Walia;

IRG - Mr. Alain Streicher and Dr. Satish Kumar

Purpose: To take stock of the Regional Energy Efficiency Center initiative and decide on the next steps.

Key Outcome: USAID will send a letter to BEE summarizing the points discussed and propose a framework for proceeding with REEC initiative to take advantage of the ongoing ECO-III program and an expected new initiative to promote REEC under Asia Pacific Partnership with support from Department of State.

The meeting was follow-on to the Brainstorming Workshop on Regional Energy Efficiency Centers (REEC), January 25, 2007 at Delhi organized by USAID in partnership with BEE and participated by over 75 energy efficiency professionals and agencies in the country. Mr. Padmanaban of USAID briefly reviewed the salient recommendations of the brainstorming workshop and provided a status update on the expected new Department of State initiative under the Asia Pacific Partnership (APP) to promote the concept of Regional Energy Efficiency Centers in India. The APP initiative will provide technical assistance, help organize and conduct study design tours on appropriate and relevant topics for stakeholders, limited and strategic support in the procurement of equipment, and support institutional partnerships between Indian and US -based Center of EE Excellence (e.g. Lighting Research Institute, Windows and Day lighting Group, LBNL, etc.).

Dr. Mathur of BEE identified the key features that BEE would like to see in the REEC. The REECs should be agents of market transformation providing state of the art equipment supported by highly qualified professional staff for the training, testing, and certification of energy-efficient products and services. Further, the REECs should have a sustainable business model so that after initial support, there should be a clear plan on how the REECs can operate without government support and subsidy. A business model based on public-private partnership (PPP) should be developed and refined over a period of time. Further, BEE expressed the desire to develop REECs to promote energy efficiency or sustainability concepts in buildings

Potential topics for REECs (based on interest shown by different stakeholders) are:

- Energy Efficient Home Appliances
- Energy Efficient Motors
- Energy Efficient Pumps
- Energy Efficient Lighting
- Eco-Housing (Building Sustainability)

- Windows and Energy Simulation

BEE and USAID decided to use the limited funding available under ECO-III technical assistance to jump start the REEC initiative by taking the help of IRG to outline the process involving the following steps:

- Establishment of a committee that will be in charge of developing the process for accepting proposals, reviewing them, and making final selection;
- Develop the format and content for Expression of Interest describing the objectives of the exercise, key information that is requested and the selection criteria that will be used for short-listing/selecting the submitted proposals;
- Selection or prioritizing of the submitted proposals;
- Conduct one pre-feasibility study of the short-listed proposal;
- Work together with the APP initiative and build on the work conducted under the ECO-III project;

APPENDIX-C

Concept Note for Seeking Proposal from Organizations for Establishing REECs

(October 31, 2007)

Background

Keeping in view the Energy Conservation Act 2001, and existing government policies and initiatives, USAID funded ECO-III Project plans to support setting up a few Regional Energy Efficiency Centers (REECs) in India, mainly to enhance energy efficiency awareness and education among energy end-users as well as public at large, facilitate showcasing and demonstrations of energy efficient products, promote technology development (incubation), encourage research and interdisciplinary collaboration, and catalyze the development and growth of energy efficiency market and business in the country.

Each REEC is expected to be a part of an existing institution or organisation but should plan to work with a sustainable business model with a long-term operational plan. On the basis of merits of the proposal from the willing Host institution/organization, the start up funds and technical assistance from an appropriate US institution could be provided through USAID and other resources. However in the longer run the REEC is expected to diversify its funding sources, receiving funds from multiple origins, in an effort to become self sustaining. The initial and ongoing funding for REEC could be secured by the Host Institution through public-private partnership such as the State government, private or state owned electric utilities, industry, foundations, other aid agencies, etc.

REEC should be well focused in carrying out its functions but needs to be flexible enough to develop collaborative models with academia, energy efficiency service providers, financial institutions, energy-efficient equipment vendors, industry associations, etc. The administrative setup for REEC is likely to be oriented keeping in view the identified objectives of REEC, its funding sources, and its target group, and host of other factors considered important for the functioning of REEC.

Potential themes for REECs

Giving consideration to the deliberations in the workshop organized by USAID in partnership with Bureau of Energy Efficiency (BEE) in January 2007 and the follow up meeting with BEE, the following potential themes are being envisaged for REECs at present:

- Energy Efficient Domestic Appliances
- Energy Efficient Motors
- Energy Efficient Pumps
- Energy Efficient Lighting
- Energy Efficient Envelope (Glazing, Insulation, etc.) and Building Energy Simulation
- Energy efficient HVAC and Energy Management Control Systems
- Energy Loss Detection/Diagnostic technologies
- Energy Efficiency in Small and Medium Enterprises

However depending on the merits, other themes would also be considered by ECO-III Project, in consultation with USAID.

Proposal for Technical and Financial Support

Existing institutions/organizations which are willing to host REEC should submit their proposal to USAID ECO-III Project being implemented by IRG. A well-drafted Proposal (of 4-6 pages) to set up REEC should be structured as per the attached recommended format (Appendix C-1). The Criteria for evaluation of the proposals are listed in Appendix C-2.

APPENDIX- C1

Recommended Format for Structuring the REEC Proposal

1. **Executive Summary of the Proposal**

2. **Background and Context**

   - Major functions and the charter of the Host Institution willing to establish REEC
   - How does the proposed REEC intend to relate its envisaged functions with respect to the EC Act 2001 and other Government policies and initiatives
   - What are the salient energy efficiency issues and barriers, the proposed REEC plans to address, and initiate activities innovatively
   - How does REEC see itself as a catalyst of energy efficiency market transformation in the near future

3. **Objectives of REEC**

   - Short term (span of 1-2 years) Objectives
   - Long term (span of 3-5 years) Objectives

4. **Focus Areas and Main activities of REEC**

   - Focus area (one or more) of the selected theme could possibly be from the following:
     - Specialized training on the selected theme(s)
     - Outreach – showcasing/demonstration of energy efficient products and technologies
     - Technology incubation
     - Research/Analysis on specific area(s)
     - Development of tools (e.g. soft-wares) to promote energy efficiency
     - Any other area that promotes energy efficiency innovatively
   - Major activities envisaged under the selected theme in the short-term and long-term
   - Brief on the technical assistance (domestic and international) needed to enrich the quality of outputs of REEC

5. **REEC and its Partner Organizations**
   - Proposed organizational structure of REEC and its professional linkages with host institution and other partner institutions/organizations supporting REEC
   - Role and Support (in-kind/financial/technical/administrative) of partner institutions/organizations in public and private sectors

6. **Major Benefits and Impact of REEC Activities**

   - What are the major benefits expected from REEC activities, how these will create a multiplier effect or major impact at the State or national level in the next 3-5 years

7. Facilities and infrastructure Requirements for REEC

- What facilities and infrastructure of the host institution will REEC utilize and under what specific conditions, and what are additional requirements to carry out REEC activities

8. Staffing Plan of REEC

- Core team staff and a brief on the administrative arrangements required to effectively perform REEC activities

9. Financing of REEC

- A brief write up on how the Host Institution would like to finance the establishment and operation of REEC with it's own/partners' resources and USAID funding in the short and long term

APPENDIX- C2

Evaluation Criteria for Assessing REEC Proposals

The following Criteria (listed in random order) will be considered in the evaluation of the proposals from the Host Institutions:

S. No.	Evaluation Criteria	Weighting Factor
1.	Commitment to the initiative (from management to committed resources)	10%
2.	Overall vision for REEC	5%
3.	Understanding of the challenges to be faced in establishing REEC and ability to confront such challenges	5%
4.	Technical strength and innovativeness	5%
5.	Synergy with existing policies and initiatives of the Government	5%
6.	Multiplier Potential of REEC's proposed activities/ technologies	10%
7.	Quality of infra-structural facilities	10%
8.	Ability to develop sustainable partnerships	5%
9.	Financial resources (incl. ability to raise in-kind resources)	20%
10.	Core Team Credentials	15%
11.	Past experience	10%
	Total	**100%**

APPENDIX-D

Regional Energy Efficiency Centers - Features of Proposals from Organizations

No.	Institution & Location	Theme	Features in brief
1	West Bengal Renewable Energy Development Agency (WBREDA), Kolkata	Energy Efficient Domestic Appliances	• Technical support to small manufacturers of domestic appliances (lighting, air-conditioners, cooking devices, pumps, washing machines, etc.) • Already created 'Energy Clubs' with 25 technical institutions to promote energy efficiency in urban and rural areas • Promotion of energy efficiency standards • Establishment of demonstration/exhibition center • To work as information hub • Publication of awareness material for public • Undertake research work • Funding from Central/State Government, public utilities, major industries; also would generate its own revenue
2	Nonferrous Materials Technology Development Center (NFTDC), Hyderabad	Energy Efficient Motors	• Aims to enhance energy efficiency of AC motors (single phase and 3 phase induction motors with range 0.25 – 50 HP) • Plans to be a testing & calibration facility for motors • Would address the needs of training, technology transfer, dissemination, regulations, standards, energy audits, etc. • Currently functioning as Enabling Technology Center under a project (2006-09) co-funded by GEF, CFC and International Copper Association (ICA) • Partner organizations: ICA and ICPCI • Technical Specialists already exist
3	Electric Lamp & Component Manufacturers' Association of India, (ELCOMA), Delhi	Lighting Excellence Center	• Would set up lighting and illumination exhibition and demonstration center, promotional awareness activities • Test lab & research center services to support end-users in measuring performance of lighting systems/technologies • Indian/International Data Generation activities relating to lighting

No.	Institution & Location	Theme	Features in brief
			• Offer Training, Education and energy audit services • Organize seminar, conferences, etc.
4	Center for Environmental Planning and Technology (CEPT), Ahmedabad	EE for Building Envelope, Fenestration and Simulation	• Build envelope energy performance lab & establish certification and labeling program for fenestration & related products • Provide training on whole building performance and 'train the trainers' programs • Building bye-laws to deploy ECBC at local level • Development of software tools for ECBC Compliance • REEC to be under the aegis of CEPT University, and this would provide infrastructural facilities, complete administrative and faculty support, would hire specialists, etc. • Internal funding is expected from CEPT University
5	SECO Control, Chennai	Rural Energy Self Efficiency	• SECO and ITCOT would be jointly promoting the REEC • Showcase and demonstrate rural energy self sufficiency • Develop technical pool for proper tech-commercial guidelines • All the facilities to be created from foundations • Staff would be recruited
6	SEE Tech Solutions Pvt. Ltd., Nagpur	Energy Efficiency and Renewable Energy Technologies	• Capacity building of energy auditors and energy managers through training utilizing hands on practical & software applications • Physical demonstration of models related to energy efficiency concepts, products and technologies (including incubation stage) • Expected to seek support from other institutions • Has set up building on its own land to host REEC • Needs support to strengthen model demonstration units, IT Set up, Lab, training hall and office infrastructure

APPENDIX-E

Regional Energy Efficiency Centers - Evaluation Committee Members

1. Mr. S Padmanaban, Senior Energy & Environment Advisor, US Agency for International Development, (USAID), New Delhi
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9. Prof. Sujay Basu, Director, Center of Energy & Environment Management, Kolkata
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APPENDIX-F

Suggested Guidelines for Members for the Evaluation of Proposals on REECs

What does the Institute want to do?

- Is it something novel or different the Institute trying to do?
- Does the focus areas selected address the current energy efficiency issues?
- Do the activities envisaged have synergy with existing Government policies and EC Act 2001?
- Does it likely to create reasonably good impact in near term?
- Does it likely to have multiplier potential?
- Does the institute have a good track record (past experience) in energy efficiency?

How does it want to do?

- Whether the proposed activities are extension of existing activities or quite different?
- Does the approach adopted to address the energy efficiency issues is innovative?
- Does the institute have adequate infrastructural facilities (e.g. land, building, etc.) of its own or from the host organization to carry out the major functions of REEC?
- How strong is its Core Team to manage functions of REEC?
- Does it have sufficient technical, managerial and administrative strength to start and operationalize REEC?
- How it would raise its start up and on-going financial resources to achieve self sustainability in the ling-term?
- Does the institute plan to promote public-private partnership and net- working with other supporting institutions? Will it be effective and sustainable?

What specific assistance does it need from USAID?

- Has the institute clearly identified specific technical and financial assistance needed from USAID?

Other considerations

- Does the Institute have the overall perception and vision of REEC?
- Has the Institute understood challenges, and would it be able to develop its institutional capacity to confront the same?
- How committed is the management?

Profile of REEC for Buildings and Energy Simulation at CEPT, Ahmedabad

Mission

Center for Sustainable environment and energy at CEPT aims to serve society by providing impetus for creation and dissemination of knowledge for sustainable built environment. REEC to strengthen CSEE by working dedicatedly in area of building envelop design, fenestration testing and building energy simulation research**.**

Goals

a) Generate robust knowledge database for energy efficient scenario of built form environment in India
b) Create enhance knowledge of constriction material, methods and practice for energy efficient buildings in India.
c) Extend research and dissemination activities in area of Urban Planning and design with integrated approach to resource planning including energy, water and land.

Objectives

a) Establish state-of -art building simulation facilities & conduct training programs for professionals & educators
b) Help government to formulate & implement energy conservation policy & initiatives and also help local government to adopt ECBC & formulate local building regulation to comply ECBC
c) Build advance building envelop energy performance laboratory & establish certification and labeling program for fenestrations & related products.
d) Construct its own building demonstrating best of design & technology - CSEE is envisioned this to be a living laboratory for research in energy efficient buildings.

Activities of REEC

REEC will focus primarily on following three activities:

Training

a) Whole building energy performance training
b) Training for fenestration & related product testing methods
c) Energy efficient building and urban design
d) "Train the Teachers" program for educators

Research and Development

a) Building design research and development of construction technology database
b) Building bye-laws preparation to deploy ECBC at local level

c) Energy Policy research & energy management
d) Development of software tools for code compliance
e) High performance building research for Indian context and benchmarking of low energy architecture.
f) Conduct studies for energy consumption patterns in various building sectors

Outreach

a) International & National level conferences
b) City level awareness programs & exhibitions
c) Low energy building design demonstration projects
d) Demonstration of integration of renewable energy sources in architectural design
e) Educational web site for public, open course ware for professionals & database for industry

REEC Services

REEC will offer its services to government, not-for-profit organizations, professional bodies and associations, academic institutes and industry in following areas.

a) Whole building Simulation and building component simulation training.
b) "Training of Trainers" & development and teaching content & curriculum
c) Testing of fenestration materials and products.
d) Building code implementation capacity building for local governments.
e) Sponsored research in building material and improved methods of construction
f) Building Bye-laws preparation and development of guidelines.
g) Development of computer software tools for code compliance
h) Conferences and Seminars on Green building design and technologies

APPENDIX-H

Profile of REEC for Domestic Appliances at WBREDA, Kolkata

Mission

Catalyze and facilitate the use of energy efficient domestic appliances and equipment in the households of West Bengal and neighboring North Eastern States of India

Goal

Establish a 'Regional Energy Efficiency Center for Domestic Appliances' that acts as an information hub on appliance energy efficiency and promotes demonstration of energy efficient domestic appliances and equipment

Objectives

Create state level awareness for adoption of energy efficient domestic appliances by reaching different cross-sections of society including appliance manufacturers

Activities of REEC

Development of REEC Strategy on Energy Efficiency

The importance of energy efficiency for domestic appliances has been sufficiently recognized by WBREDA. However there is hardly any information on domestic appliances both with respect to their energy intensiveness and overall impact on the growing energy consumption in the residential sector. Therefore for developing an appropriate strategy for REEC, it is planned to carry out a comprehensive State level Base-line Study (through customers and retailers sample surveys, involvement of prominent appliance manufacturers/traders associations, etc.) to establish relevant data and carry out analysis on domestic appliances (BEE labeled and ISI marked as well as other sub-standard and inefficient ones produced by SMEs). The Base-line Study is expected to include analysis of mass selling energy inefficient appliances and their expected growth projections, appliance pricing and traders' interests on selling non-standard appliances, awareness on life cycle costing, government procurements for their staff residential apartments/colonies, fiscal incentives for consumers, SMEs issues, etc.

On the basis of findings of the Base-line Study, REEC would plan to focus primarily on following four major activities, and accordingly 5-year Business Plan for REEC would be developed for ensuring long-term sustainability. The Business Plan would establish continuity of additional financial support from the State Government and other stakeholders and the revenue generation by the Center:

1. **'Awareness and Education'** on energy efficiency aspects of electric domestic appliances/equipment to the end-users and public at large, in the State of West Bengal initially and subsequently extending to the North Eastern States: For implementing this activity involvement of consumer forums, housewives' associations, selected schools, chambers of commerce and industry, existing energy clubs of WBREDA and Panchayat network would be utilized to spread the energy efficiency awareness in the State.

2. **'Demonstration and Show casing'** of energy efficient domestic appliances and equipment and newer techniques/technologies to the end-users and public at large: To facilitate in implementing this activity in an unbiased manner, need for requisite equipment, hardware and other suitable systems and facilities for display and demonstration would be established through a study, and participation of relevant manufacturers would be promoted.

3. **Enhancement of 'Efficiency Standards of Appliances produced by SMEs'** to facilitate and guide SMEs to adopt newer techniques and manufacturing practices to raise energy efficiency of domestic appliances produced by them. For this activity, REEC would carry out technology assessment study to establish energy efficiency standards of domestic appliances being manufactured by SMEs. In this context, guidance and support from technical institutions such as Jadavpur University, IIT Kharagpur, concerned State Government institutions, technical experts, etc. would be sought. In addition, active involvement of progressive SMEs associations would be pursued. Suitable program for enhancement of technologies in SMEs would be developed.

4. **Promotion of procurement of energy efficient appliances** in residential colonies and apartments, guest houses, etc. of the State Government departments and public institutions: This activity would be undertaken to promote the replacement of energy inefficient appliances and enhance the procurement of BEE labeled and ISI marked domestic appliances in government staff houses/colonies. REEC would approach concerned State Govt. departments. As the Programme is implemented, REEC would monitor the penetration of the efficient appliances in the above-mentioned two sectors on yearly basis to review and modify the program to enhance energy efficient procurements.

APPENDIX-I

Profile of REEC for Industrial Furnaces in SMEs, at See Tech, Nagpur

Goals

a) Promote implementation of energy efficiency (EE) and renewable energy (RE) technologies in industrial furnaces in SMEs
b) Develop REEC as a nodal source for metallurgical units in SMEs for EE & RE technology demonstration and technology incubation
c) Serve as a networking avenue for SMEs and technology providers
d) Develop the center as CSIR approved organization for research and development

Objectives of REEC

a) Build capacity of practicing energy auditors, and energy managers and plant personnel from SMEs by providing training on energy efficiency, by showcasing pilot/lab scale demonstration models and software tools
b) Develop trained professionals who will actively provide services to SMEs
c) Popularize substitution of expensive fuels by cheaper and agro-based fuels in furnaces in SMEs
d) Serve as platform for sharing information on best practices and energy efficient technologies amongst SMEs
e) Benchmark various metallurgical sectors such as re-rolling, forging, foundries, etc. in SMEs for energy consumption GHG emissions

Activities of REEC

Major activities envisaged for SMEs under REEC would as follows:

Training: Specialized training activities for SMEs that have furnaces as their major energy consuming equipment will be designed and conducted, utilizing hand on exposure on pilot level or lab scale models and IT based software applications and monitoring tools. It is planned to have demonstration models and other facilities to focus on the following energy conservation measures in furnaces:

- Fuel substitution and Agro based gasifier
- Utilization of waste heat (for preheating of charge or combustion air)
- Monitoring of operational parameters of induction furnace at remote locations

For establishing the demonstration models, analysis of available technologies, equipment and facilities would be undertaken. The models will be used for showcasing energy efficiency concepts, products and technologies. Physical demonstration models will be backed up by hands on working on software applications. Towards this following would be undertaken:

- Update and enhance available software
- Enhancement of web-based training

Research and Analysis: This would be carried out with sector specific studies in metallurgical units. Results from past experience and a fresh survey of SMEs in foundries, re-rolling mills and other metallurgical units (at least 10 units each in 3 sectors) would be carried out. The results of the Analysis would be used for Benchmarking of SMEs for energy consumption and GHG emissions.

Development of a standard approach for efficiency determination: This will be undertaken for various types of furnaces used in SMEs

Development of best practices manuals and case studies: These would be developed in English and other regional languages of India for dissemination of knowledge in SMEs.

Development of On-line system for monitoring performance of furnaces: situated in remote locations and providing a system that will give recommendations on site to the large number of metallurgical units in SMEs

Development of on-line and off-line EE performance evaluation tools: to cater the needs of SMEs

APPENDIX-J

Profile of REEC for Electric Motors at NFTDC, Hyderabad

Mission

Since Aug 2006, NFTDC with support from International Copper Association, (ICA) has been functioning as an Enabling Technology Center (ETC) with a mission to conceive, develop and demonstrate an integrated technology solution for high efficiency motors with emphasis on copper rotors and transfer efficient technology to industry at large.

ETC co-funded by Common Fund for Commodities, Global Environment Fund, has an outlay of about 1.3 million USD for three year duration (2006-9). Thereafter NFTDC plans to manage the facility on self financing basis.

Goals

a) Convert and grow ETC nucleus into an integrated energy efficiency center for motors and motor driven systems by leveraging existing resources comprising of physical assets, knowledge and human resources

b) Enhance energy efficiency of motors used in agriculture pumps, domestic appliances and industries

Objectives

Integrate REEC with ETC and address both technical as well as migration related issues under one roof, having following three components

a) Address technology development aspects comprising of material, processes and design of motors for energy efficiency;

b) Testing and evaluation of electric motors for energy efficiency.

c) Promote transfer of efficient technologies and technical knowledge to the manufacturers, motor end-users, etc.

Target Group and Services

NFTDC plans to provide services to the following target groups under ETC and REEC:

Small and medium motor manufacturers: To support them with technology to manufacture high efficiency and super efficient motors cost effectively and also help them in market promotion of these premium products.

a) Energy intensive end users: Under Energy Conservation act 2001 certain energy intensive industrial sectors (with connected load above 500kVA) have been mandated to appoint energy managers and undertake energy conservation activities. These energy managers and energy auditors would be equipped with proper skills to select high efficiency motors.

b) Policy makers: Inputs would be provided to design innovative incentive schemes for procurement of energy efficient motors.

Major focus of REEC Services

Since the technology development for energy efficient motors and transfer of efficient technologies would be addressed by ETC, it is planned that REEC would address primarily on testing and evaluation of motors for energy efficiency. Following types of motors with capacity varying from 0.1 HP to 15 HP are being focused for testing and evaluation under REEC:

No.	End-Use Sector	Appliance & Equipment	Motor Speed (rpm)	Motor Rating (HP)
1	Domestic	Fans, Pumps, kitchen appliances, Refrigeration compressors, etc.	750-3000	0.1 to 1
		Washing machines, driers, mixers, spinning applications, etc.	3000-8000	0.1 to 1
2	Commercial	Hard drive for computers, BLDC & PMDC motors	8000 & above	0.1 to 1
3	Industry	Industrial machine tools	8000 & above	1 to 5
		High speed CNC Machines	8000 & above	1 to 5
		Industrial Motors	1450-3000	5 to 15
		High speed Industrial Motors	Above 3000	5 to 15
4	Transport	Electric Vehicles	3000-8000	1 to 5

NFTDC Partner Organization

International Copper Promotion Council India (ICPCI, the Indian arm of ICA and partner organization of NFTDC) has been involved in the promotion of high efficiency motors (HEM) since 2000. ICPCI is supporting the on-going energy efficiency standards and labeling program of BEE. It is providing its inputs on life cycle costing of HEM to energy intensive industries. It is also building the capacities of energy managers and auditors through training on energy management and electric motors.

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