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COLOMBIA CLEAN ENERGY PROGRAM

FIRST YEAR WORK PLAN

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COLOMBIA CLEAN ENERGY PROGRAM

FIRST YEAR WORK PLAN - DRAFT

Prepared for:

Office of Environment
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Prepared by:

Tetra Tech ES, Inc.
4601 North Fairfax Drive, Suite 601
Fairfax, VA 22203
www.tetratech.com

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LIST OF ACRONYMS AND ABBREVIATIONS

ACIP	Afro-Colombian and Indigenous Program (USAID Program)
ADAM	Areas for Municipal Level – Alternative Development Program (Áreas de Desarrollo Alternativo Municipal - USAID Program)
APROTEC	Local renewable energy company
BIO-REDD	Reduced Emissions from Deforestation and Degradation (USAID Program)
CCEP	Colombia Clean Energy Program (USAID Program)
CDM	Clean Development Mechanism
CE	Clean Energy
CELI	Consolidation and Enhanced Livelihoods Initiative (USAID Program)
CIDET	Corporation Center for Technological Research and Development of the Electrical Sector (Corporación Centro de Investigación y Desarrollo Tecnológico del Sector Eléctrico)
CNPMLTA	National Cleaner Production Center (Centro Nacional de Producción mas Limpia y Tecnologías Ambientales)
COP	Chief of Party
COR	Contracting Officer Representative
CP	Cleaner Production
DNP	National Planning Department (Departamento Nacional de Planeación)
DO	Development Objective
EC-LEDS	Enhancing Capacity for Low Emission Development Strategies
EE	Energy Efficiency
EPM	Empresas Públicas de Medellín
FAER	Support Fund for Renewable Energy (Fondo de Asistencia a Electrificación Rural)
FAZNI	Support Fund for the Non-Interconnected Zones (Fondo de Apoyo Financiero para la Energización de las Zonas No Interconectadas)
FNR	National Royalty Fund (Fondo Nacional de Regalías)
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIS	Geographic Information System
GOC	Government of Colombia
IPSE	Institute of Planning and Promotion of Energy Solutions in the ZNI (Instituto de Planificación y Promoción de Soluciones Energéticas para las ZNI)
IR	Intermediate Result
ISAGEN	Public private energy utility corporation
LCA	Life-Cycle Assessment
LEDS	Low Emission Development Strategies
M&E	Monitoring and Evaluation
MADR	Ministry of Agriculture and Rural Development (Ministerio de Agricultura y Desarrollo Rural)
MADS	Ministry of Environment and Sustainable Development (Ministerio de Ambiente y Desarrollo Sostenible)
MFI	Micro-finance institutions
MIDAS	Más Inversión para el Desarrollo Alternativo Sostenible (USAID Program)
MME	Ministry of Mines and Energy (Ministerio de Minas y Energía)

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MRV	Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Actions
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
PROURE	Program of Rational and Efficient Use of Energy and Other Forms of Non-Conventional Energy (Programa de Uso Racional y Eficiente de Energía y Fuentes No Convencionales)
RE	Renewable Energy
SME	Small and Medium Enterprises
Tt	Tetra Tech (Prime Contractor)
UPME	Mining and Energy Planning Unit (Unidad de Planeación Minero Energética)
USAID	United States Agency for International Development
ZNI	Non-Interconnected Zones (Zonas no Interconectadas)

1. INTRODUCTION

1.1 GOALS AND OBJECTIVES

The Colombia Clean Energy Program (CCEP) is a 5-year (January 2012-January 2017) project designed to increase access to renewable energy sources and energy efficient practices in Colombia through a combination of project development support, technical assistance, and enabling environment reforms. CCEP is USAID/Colombia's flagship clean energy activity, funded under the Presidential Initiative on Climate Change, and includes a \$1.8 million micro-finance component in renewable energy. The overall goals of USAID's environment program are strengthening environmental governance, low carbon growth, conservation of significant biodiversity, and support to adapt to climate change.

USAID/Colombia's Strategic Framework for FY 2010 to FY 2014 overall goal is to improve economic and social conditions of vulnerable Colombians with effective rights-based institutional presence. To achieve this goal, the Strategic Framework identifies four Development Objectives (DOs) to achieve the Mission's higher level goal. CCEP will directly advance the Development Objective for Environment which will strengthen environmental governance for the conservation of protected areas and ethnic territories; preserve, restore or improve ecosystem services; ensure the environmental sustainability of natural resource-based livelihoods; mitigate or adapt to the long-term impacts of climate change; and promote the use of renewable and clean energy. The Development Objective for Environment is linked to Foreign Assistance Objective 4, Economic Growth; Program Area 4.8 Environment; and Program Element 4.8.2 Clean Productive Environment and is supported by three intermediate results (IR):

- IR. 4.1 - Environmental governance strengthened
- IR 4.2 – Climate change mitigation and adaptation improved
- IR 4.3 – Conservation of biodiversity improved

CCEP will directly support Intermediate Results 4.1 and 4.2.

1.2 SCOPE OF WORK

Colombia's success in reforming its energy sector and delivering high-quality power across much of the national grid speaks to the skill and foresight of its energy sector planners and regulators. Now, the challenge is to foster implementation of energy efficiency and grid/off-grid renewable energy programs. The question is "How can USAID's Colombia Clean Energy Program be successful in creating a delivery system for clean energy to the non-interconnected zones (ZNI) while advancing the government's renewable energy and energy efficiency goals?"

The answer lies in engaging and mobilizing broad Colombian resources dedicated to program design and implementation, and quickly adapting from extensive international, regional and national best practices. USAID's CCEP can be implemented successfully through 1) utilizing the substantial legal and regulatory framework already in place to advance renewable energy and efficiency objectives, 2) creating dedicated project delivery teams and organizations under each task, and 3) strengthening national, departmental and local organizations to absorb the new tools and methodologies that our team will provide to ensure sustainability.

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CCEP is articulated around three tasks which are summarized below:

Task 1: Renewable energy and energy efficiency enabling environment and institutional capacity development. - (IR. 4.1 - Environmental governance strengthened) Tt will work closely with the Ministry of Mines and Energy (MME), the Mining and Energy Planning Unit (UPME), the Institute of Planning and Promotion of Energy Solutions in the ZNI (IPSE) and other institutions to derive access and renewable energy targets, and implement efficiency and renewable programs in the ZNI. Our work will integrate ongoing GOC efforts by MME, UPME, Ministry of the Environment and Sustainable Development (MADS) and the National Planning Department (DNP) in the fields of EE and ER planning, policy and regulatory development, identify viable projects and provide capacity building across all technical areas, particularly in PROURE, LEDS, Nationally Appropriate Mitigation Actions (NAMAs) and Monitoring, Reporting and Verification (MRV) processes. Closely linking with Task 3, CCEP capacity building will also focus on stimulating private sector integration of EE and RE technologies and investment opportunities as standard practice by the industrial sector through assistance in the development and promotion of financial mechanisms in Colombia’s banking system.

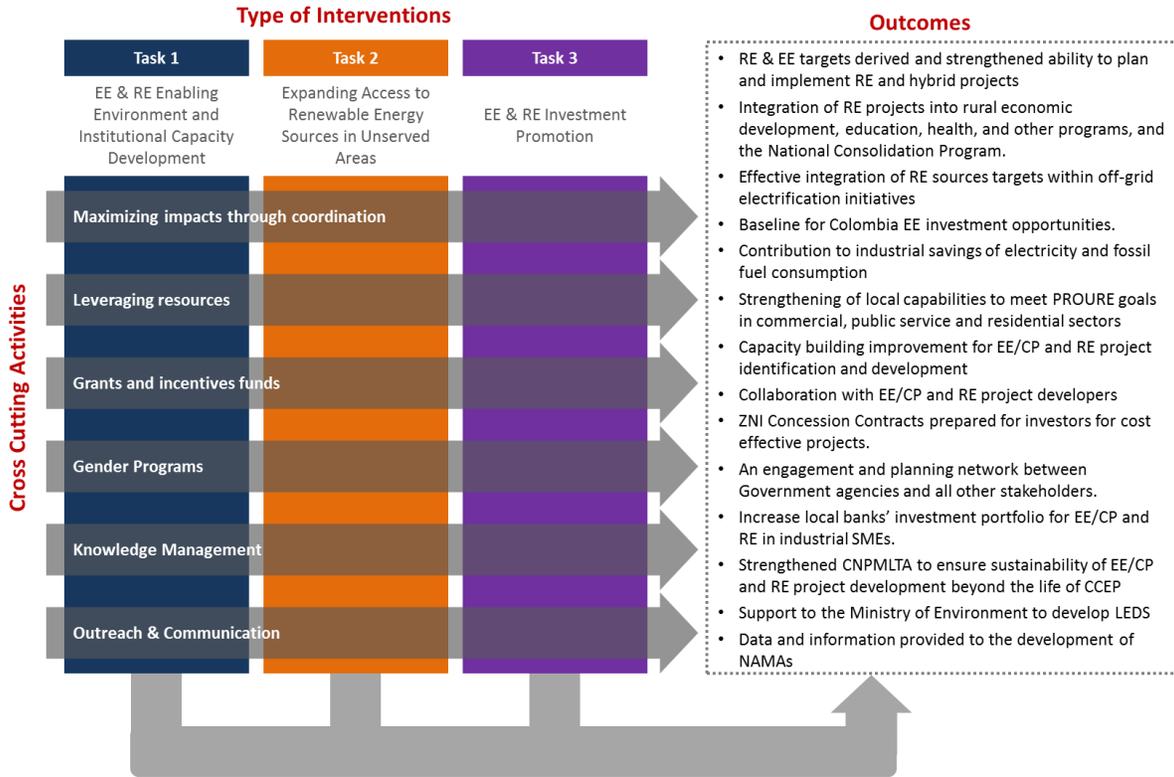
Task 2: Expanding access to renewable energy sources in currently unserved areas. - (IR 4.2: Climate change mitigation and adaptation improved). Our main focus will be to stimulate the development of Renewable Energy (RE) projects through technical assistance to IPSE, UPME, other local agencies and NGOs, and implementation of a mix of projects that includes centralized energy systems (e.g., micro-hydro) and distributed systems (e.g., PV). Our approach will support the entire renewable energy project cycle: resource assessments and mapping, GIS tools for project identification, cost analysis, and transaction and financing support. We also recognize the need for strong community support for projects through outreach and education and will deploy participatory approaches to support productive energy use by rural communities.

Task 3: Energy efficiency and renewable energy investment promotion - (IR 4.2: Climate change mitigation and adaptation improved). Studies show that more than 220 Mt CO₂e in combined emissions reductions can be achieved across all sectors of the Colombian economy in 20 years. Tt and CNPMLTA are well situated to direct programs and facilitate investment for a large portion of this potential. Closely linking to Task 1, we will identify renewable energy (RE) and energy efficiency (EE)/ cleaner production (CP) investment opportunities in key sectors, work with several funds and credit lines to develop new mechanisms to fund EE/CP and RE projects, and offer training and advisory services to financial institutions and industries.

To accomplish USAID’s objectives, Tt’s team has strong Colombian experience and delivery capacity. This will maximize program delivery through the most highly respected Colombian NGOs, businesses, and government agencies.

Figure 1: CCEP Overall Program Structure

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2. WORK PLAN BY TASK

CCEP will employ a “results-driven” approach to implement the scope of work. During the first year, it will focus on front loading the early implementation of “quick wins” projects (low hanging fruit) based on the knowledge and experience of our local team leaders, and supplemented by progress made by recently completed or ongoing USAID and other donor projects.

CCEP interventions are designed to facilitate the development of commercially-viable, small-scale, renewable energy and energy efficiency projects. It will build on what has been accomplished in Colombia, support Colombian efforts during its operations, and aim to create sustainability so its impacts can continue beyond its five-year lifespan. The project will also pay close attention to maximizing both its impact and use of resources by carefully selecting, prioritizing, staging and sequencing its activities. The formal planning exercise conducted for this work plan will be repeated at least annually to ensure CCEP is on course efficiently and effectively.

This section describes the activities planned under each of CCEP’s three tasks, as well as project mobilization activities. The main focus of the first year work plan is the activities for the first 18 months of the project. Activity description for the remaining 42 months are mentioned, but are less specific and more flexible to allow the project to respond to changing conditions. Appendix A contains the full Gantt chart showing the implementation schedule for all CCEP activities for the first 18 months.

2.1 INITIAL COORDINATION AND MOBILIZATION

During the last two weeks of January 2012, Tetra Tech formally initiated CCEP’s mobilization activities. During the first two weeks of February 2012, the team gathered in Bogota to participate in the official kick-off meeting with USAID personnel at the US Embassy. This meeting was essential to close some open ended items such as: 1) location of main project office, and 2) understanding new issues associated with the preferred implementation approach by USAID, mainly due to the nature of earmarked funds available to be used by CCEP, and changes within the GOC willingness to move forward with the creation of an EE entity/unit.

In parallel to those activities, other mobilization, logistical, and technical activities were carried during the months of January and February including:

- Initial working sessions by phone and in person with USAID’s COR and alternate COR
- Initial presentation of CCEP program and technical meetings with:
 - EC-LEDS team, at the Ministry of Environment (MADS)
 - Director Climate Change, Ministry of Environment
 - Mining and Energy Planning Unit (UPME) - PROURE and ZNI Energy planning team
 - Energy Division and Environmental Unit, Ministry of Mines and Energy (MME)
 - Institute of Planning and Promotion of Energy Solutions in the ZNI (IPSE) main offices and National Monitoring Center
 - Dutch Embassy and its Financial Mechanism for Rural Energization in Medellin
 - National Planning Department (DNP), Bancolombia, EPM, ISAGEN, CIDET
 - Private sector: Bancolombia, ISAGEN, EPM, CIDET
 - Universities: Los Andes in Bogotá, National University in Medellin

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2.2 TASK 1- RENEWABLE ENERGY AND ENERGY EFFICIENCY ENABLING ENVIRONMENT AND INSTITUTIONAL CAPACITY DEVELOPMENT

2.2.1 Overview

The primary objectives of Task 1 are to assist Colombian public and private institutions in creating an enabling environment and institutional capacity for renewable energy, energy efficiency and low emissions development (LEDS). Through this Task, CCEP will focus specifically on supporting intermediate result IR 4.1 (Environmental governance strengthened) of USAID's DO for the environment.

It will work closely with the Ministry of Mines and Energy (MME), the Mining and Energy Planning Unit (UPME), the Institute of Planning and Promotion of Energy Solutions in the ZNI (IPSE) and other institutions to derive access and renewable energy targets, implement efficiency and renewable programs in the ZNI, enable EE in industry and other sectors and seek to overcome regulatory barriers to RE for overall power sector

Our work will integrate ongoing MME efforts, identify specific projects, and provide capacity building across all technical areas, particularly in LEDS, Nationally Appropriate Mitigation Actions (NAMAs) and Monitoring, Reporting and Verification (MRV) processes

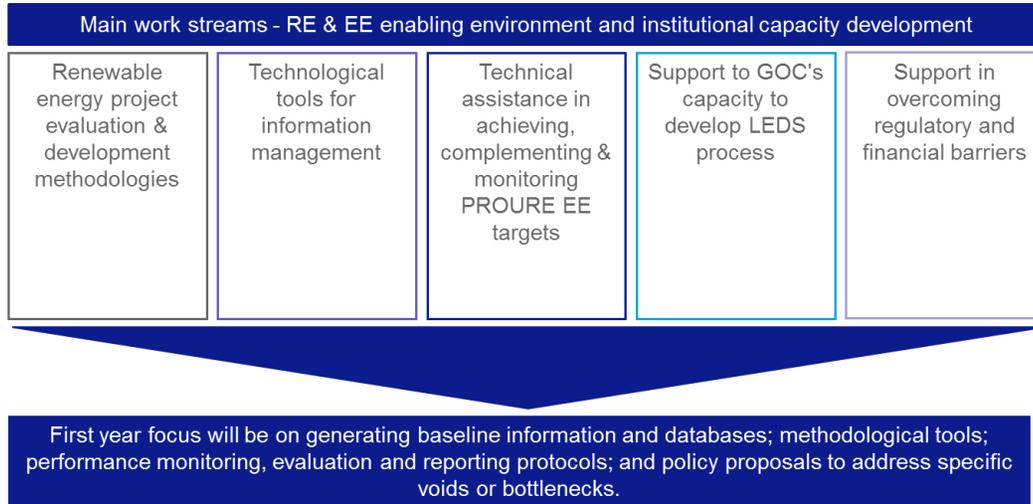
With each of the main GOC institutions involved in these areas, first phase (May 2012 – August 2013) work streams will be developed on the basis both of the tasks foreseen during program formulation and those identified with individual agencies during our initial mobilization phase. For the first period, these areas include, but may not be limited to:

- Developing practical methodologies for RE project screening, identification, formulation, finance, implementation, management and impact evaluation at the national level by IPSE, UPME and MME as well as at decentralized levels by ZNI municipalities, communities and concessionaires
- Providing support in the design and construction of geographic information systems (GIS) and other technological tools for information management of technical and strategic value for energy planning regarding the ZNI (in support of IPSE and UPME)
- Providing technical assistance to UPME for achieving current PROURE energy efficiency policy targets (Indicative Action Plan 2010-2015) as well as to address voids in current formulation, such as insufficient consideration for heat and steam generation in the industrial sector or defining explicit financial mechanisms or incentives for EE investments in industrial, commercial or other strategic sectors. CCEP will also provide technical assistance in developing Monitoring, Reporting and Verification (MRV) instruments to gauge accomplishment of PROURE's 2015 targets (in support of MME and UPME)
- Contributing advisory services and energy specific expertise to the LEDS teams and ministerial counterparts established with support of USAID and other donors, particularly in the Ministries of the Environment (MADS), of Mines and Energy, of Transportation, of Finance and of Commerce, Industry and Tourism. Work in this area will include analyzing and complementing empirical data available for the construction of LEDS, NAMAs or other adaptation and mitigation strategies and measures regarding energy efficiency in specific industrial subsectors or processes (in support of DNP and MADS)
- Analyzing bottlenecks, particularly regulatory and financial barriers, inhibiting greater participation of renewable energy sources in Colombian power generation and

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commercialization, and proposing viable policy, regulatory and financial adjustments to surpass those obstacles— particularly in light of MADS/MME Resolution 0186 (Feb 2012) which establishes a target of 6.5% participation of RE in the SIN and 30% in the ZNI by 2020 (in support of DNP, MME, MADS, UPME, CREG).

Figure 3: Task 1 – Main work streams



Future work plans will focus on building upon first year findings to deliver longer term scenarios and supply options for each ZNI, build institutional capacity to develop and implement evaluation programs, and contributions towards the development of specific NAMAs in the industrial sector and/or other areas resulting from interaction with institutions and consultants involved in LEADS and other CC initiatives

2.2.2 Overall approach

Over the past few decades, Colombia has accumulated significant renewable energy and energy efficiency experience in the form of:

- Policy formulation and project development
- Legal and regulatory developments, such as Law 697/2001 which created PROURE and most recently Resolution 0187/2012 which jointly establishes medium term energy efficiency and non-conventional energy resource (RE) targets by MADS and MME
- Specific financial resources and mechanisms, such as the FAZNI and FAER funds
- Specialized institutional organization, such as IPSE's mandate to focus on ZNI energization solutions.

It also currently extremely active in developing climate change adaptation and mitigation strategies, and the Ministry of Environment and Sustainable Development reports 19 different international cooperation initiatives addressing these issues currently under way.

Despite such an impressive array of experience and initiatives, GOC and CCEP experts have detected specific voids or bottlenecks which have been hindering achievement of objectives and targets set in the past. These have to do with (a) voids in empirical evidence and information to substantiate public policy and guide decision making and investment; (b) lack of unified criteria, methodologies and

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databases for rural energization project development in the ZNI; (c) pervasive regulatory, financial and commercial barriers to EE/RE penetration. The voids and bottlenecks already detected, and those which might surface through further CCEP interaction with public and private stakeholders, constitute opportunities for concrete CCEP contributions to moving forward in the path of sustainable, low emission development.

First year focus will be on generating baseline information and databases; methodological tools for technical, economic and geographic analysis; performance monitoring, evaluation and reporting protocols; and policy proposals to address specific voids or bottlenecks. Future work plans will focus more on building upon these initial findings and recommendations – as well as the results of Task 2 and Task 3 macro objectives discussed below – to deliver longer term scenarios and supply options for each ZNI, build institutional capacity to develop and implement evaluation programs, and contributions towards the development of specific NAMAs in the industrial sector and/or other areas resulting from interaction with institutions and consultants involved in the LEDS and other climate change initiatives.

Particular attention will be given to seeking synergies with, and awaiting results from, parallel GOC and international donor activities. This approach seeks to avoid duplication of efforts, allow those initiatives to generate expected results, and guide CCEP’s follow up on resulting recommendations or missing aspects. For example, IFC is already working on an initiative to evaluate barriers to energy efficiency, but not on barriers to RE technology penetration. CCEP will therefore endeavor to address the latter, await results of the former, and evaluate whether some of the IFC recommendations or eventual missing elements merit further development by our program in future.

2.2.3 Outputs and outcomes

Task 1 Outputs	<ul style="list-style-type: none">▪ Practical methodologies for RE project screening, identification, formulation, finance, implementation, management and impact evaluation at the national level by IPSE, UPME and MME▪ Support in the design and construction of geographic information systems (GIS) and other technological tools for information management
Task 1 Outcomes	<ul style="list-style-type: none">▪ Regulatory and financial barriers, inhibiting greater participation of renewable energy sources identified▪ Successful advisory services and energy specific expertise provided to LEDS teams and ministerial counterparts

2.2.4 Subtasks overview

During CCEP project startup, Tetra Tech and USAID carried out meetings and discussions with the numerous stakeholders mentioned in section 2.1. Follow up meetings and information exchange between the CCEP project team and GOC experts and independent advisors led to identifying immediate courses of action under Task 1 during the following months. These actions cover, but should not be limited to, the following subtasks.

a. Renewable energy project evaluation and development methodologies

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IPSE, UPME and MME have complementary roles in ZNI energization processes, but tend not to share common information bases and project planning, evaluation and implementation tools. At the territorial level, in ZNI municipalities, communities and concessionaires, these tools tend to be completely absent.

UPME has been working towards “The integration of methodologies and computerized tools for energy planning in the ZNI” and has requested CCEP’s participation and co-financing in developing a standardized approach and software tool for indicative ZNI energy planning, involving its GIS based population center data and tools, socioeconomic data, energy demand forecasting, energy supply costing, comparisons between RE and conventional energy source technologies and costs, etc. We will undertake a joint evaluation and consensus building exercise to CCEP actions in support of this specific initiative within the next two months.

CCEP will initiate work with IPSE, UPME and MME in developing practical methodologies for RE project screening, identification, formulation, finance, implementation, management and impact evaluation at the national level. In conjunction with Task 2, this work stream will also evaluate alternative simplified methodological tools which might be applied by municipal authorities, communities or energy suppliers to estimate current and projected energy demand and evaluate alternative energy supply investments to meet this demand.

b. Technological tools for ZNI information management

Both UPME and IPSE have been developing geographic information systems (GIS) covering different dimensions necessary for energy resource evaluation, grid expansion, alternative energy technology assessments and project development. Currently, UPME has geo referenced 15,000 population centers and rural locations with disperse households throughout the country not currently enjoying electricity provision, not all in the ZNI. IPSE has identified 1410 localities in the ZNI, half of which count with listings of socioeconomic attributes by the national statistics bureau (DANE). The two entities have been in discussions on information sharing and joining efforts to develop common information platforms.

CCEP will assign its GIS expert to evaluate the status of these and other institutional databases and geographic information systems and to make contributions to the development of technological tools for information sharing and management of information required for developing energy solutions in the ZNI. The initial assessment will be undertaken during the second quarter of 2012, after which a specific work plan will be jointly detailed by the three parties (IPSE, UPME and CCEP).

c. Technical assistance in achieving, complementing and monitoring PROURE energy efficiency targets

The “Rational and Efficient Energy Use and Other Non-Conventional Energy Forms Program” (PROURE) was adopted by law in 2001. Since then, indicative plans and targets for achieving energy efficiency and adoption of renewable energy forms have been developed, and were recently ratified by MADS/MME Resolution 186 (February 2012).

CCEP discussions with UPME have focused not so much on establishing joint cooperation towards achieving current PROURE energy efficiency policy targets – which are being supported by ongoing projects by other agencies (IFC, IDB, etc.) –, but more urgently to address voids in PROURE

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formulation, particularly insufficient consideration for heat and steam generation in the industrial sector or energy use in the transportation sector. In this sense, the experience being developed by CCEP under Task 3 will provide empirical evidence, practical recommendations and explicit policy proposals for PROURE to consider with regards to heat and steam generation. The extent to which CCEP can address PROURE's voids regarding energy use in the transportation sector will be evaluated together with the LEDS team (see next subtask).

A second work stream, which will be undertaken directly by CCEP's team, is to provide technical assistance both to UPME and MADS in developing Monitoring, Reporting and Verification (MRV) instruments to gauge accomplishment of PROURE's 2015 targets.

The definition of explicit financial mechanisms or incentives for EE investments in industrial, commercial or other strategic sectors will also be discussed with UPME and other GOC institutions as a third avenue of CCEP cooperation, during the last semester of the current work plan, to give sufficient time for the completion of undergoing studies by other agencies and inputs from Task 3 results.

d. Support to GOC's capacity to develop LEDS process

Colombia's LEDS process is being coordinated by MADS, but many other institutions are also involved. CCEP will provide advisory services and energy specific expertise to the LEDS teams and ministerial counterparts established with support of USAID and other donors, particularly in the Ministries of the Environment (MADS), of Mines and Energy, of Transportation, of Finance and of Commerce, Industry and Tourism.

The MRV system to be developed with UPME under subtask (c) will also serve as a pilot project in support of the Ministry of Environment towards developing more far-reaching Monitoring, Reporting and Verification protocols and methods for policies and programs by the different line ministries and agencies involved in the LEDS process.

DNP is also interested in CCEP analysis of a wealth of specific information gathered during its climate change modeling exercises with the World Bank and Universidad de Los Andes, to identify and address voids in empirical data available for the construction of LEDS, NAMAs or other adaptation and mitigation strategies and measures regarding energy efficiency in specific industrial subsectors or processes and regarding rural renewable energy.

e. Support in overcoming regulatory and financial barriers to RE power generation and distribution

Self-generation, co-generation and tri-generation (CCHP – combined cooling heating and power) with renewable energy have long been identified as technologically viable in different regions and by different industries or agro industries in Colombia. Tax incentives are already available for such technologies. However, these options have not been exercised on a scale commensurate with its potential.

Interest has been expressed by several of the GOC institutions interviewed (DNP, MADS, UPME) in obtaining CCEP input into analyzing existing bottlenecks, particularly regulatory and financial barriers, inhibiting greater participation of renewable energy sources in Colombian power generation and

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distribution, and to propose viable policy, regulatory and financial adjustments to overcome those obstacles. This seems particularly relevant in light of the recent MADS/MME Resolution 0186 (Feb 2012), which establishes a target of 6.5% participation of RE in the SIN and 30% in the ZNI by 2020, which are unlikely to be met under current conditions. CCEP has initiated an analysis of this situation and is developing terms of reference for a comprehensive analysis of this issue for implementation during the second semester of 2012.

2.2.5 Roles and responsibilities

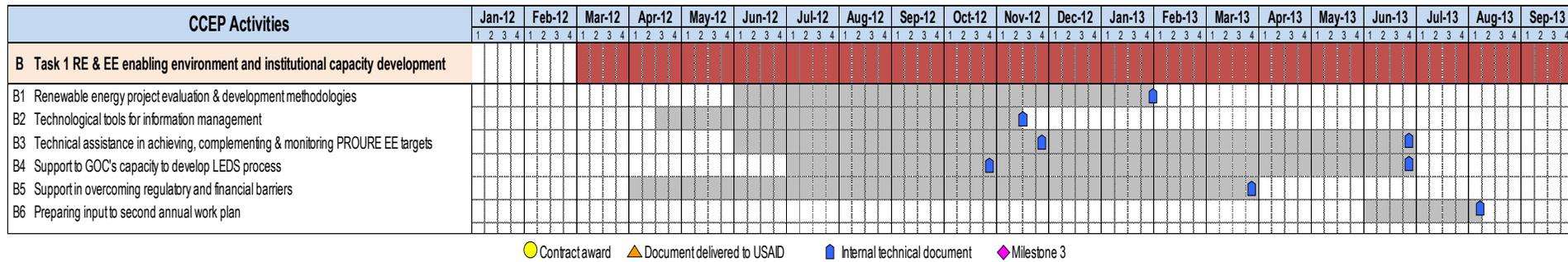
Task 1 will be led by CCEP's COP, Jose Eddy Torres, who has over 30 years of technical and institutional experience working with the energy and environmental sectors in Colombia and internationally. The Tetra Tech headquarters team of energy experts (Miguel Franco, Jairo Gutierrez, Kim Domptail and Mark Oven) will also work specifically on Task 1 initiatives. Subcontractor Segura Consulting LLC, Tetra Tech energy efficiency consultant Omar Prias and GIS consultant German Rincon will complete the pool of staff experts mobilized by CCEP for this Task.

For additional studies and consultancies, the Tetra Tech team will coordinate efforts and co-financing with GOC partner institutions.

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2.2.6 Gantt chart

Figure 4: Gantt Chart – Task 1



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2.3 TASK 2- EXPANDING ACCESS TO RENEWABLE ENERGY SOURCES IN CURRENTLY UNSERVED AREAS

2.3.1 Overview

The primary objective of Task 2 is to stimulate the development of innovative, commercially viable renewable energy projects utilizing rural entrepreneurs in accordance with the requirements of earmarks from the U.S. Congress. Task 2 directly supports Intermediate Result 4.2 – Climate change mitigation and adaptation improved. All of the projected funding for CCEP falls under the clean energy pillar of USAID’s Global Climate Change Initiative.

Work under Task 2 is structured around a two pronged implementation strategy. The first one is a top-down macro dimension focused on the long term (5-year life span of CCEP), and the second one is a bottom-up micro dimension focused on the short-term (14 months of the first year work plan) and that feeds into the macro planning.

The **macro dimension** constitutes the five year framework in which we insert the bottom-up approach. This macro dimension focuses on the following activities:

- Compilation, analysis and consolidation of institutional data banks on rural electrification and RE projects in the ZNI.
- Renewable energy resource assessment and mapping in relation to rural population centers/communities.
- Identification of financing resources and institutional mechanisms for RE project promotion at the local levels.
- Development of RE project planning and implementation methodologies.
- Capacity building for rural energy SMEs and MFIs.
- Transaction support.
- Impact evaluation.

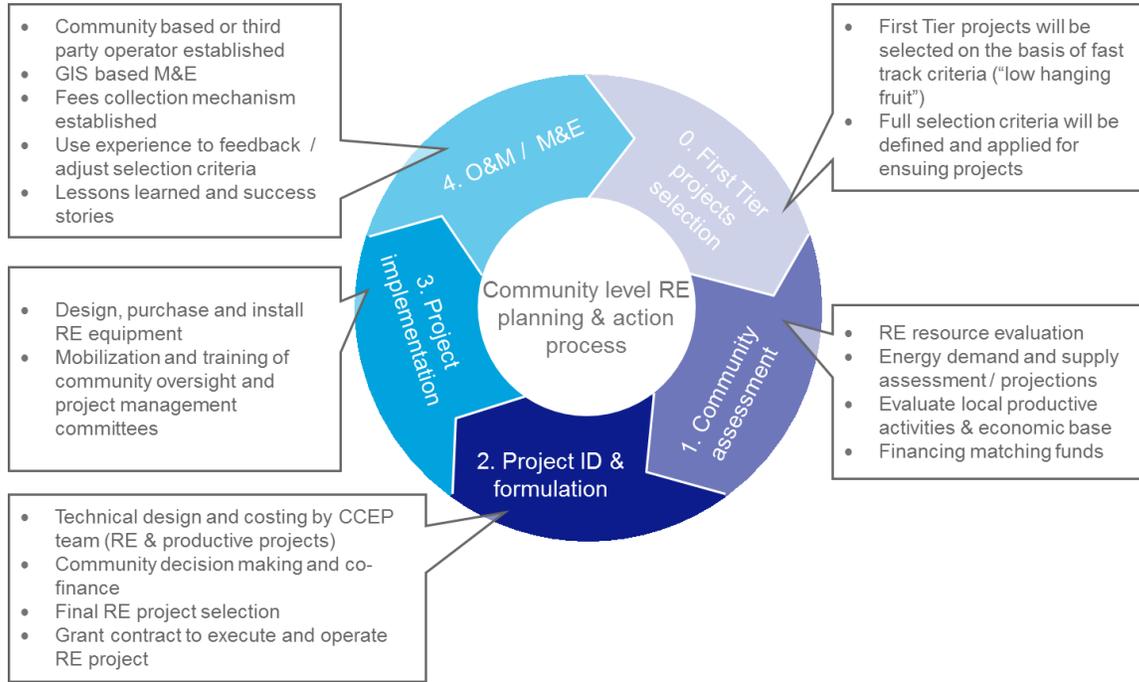
A detailed description of these activities is provided in the subtask overview section.

The **micro dimension** focuses on selecting and implementing what a first tier or short-term rural energization participatory projects that will field-test our overall approach. Nonetheless, the renewable energy interventions to be implemented in first tier communities will not be experimental or pilot cases, but will directly contribute to achieving CCEP’s ultimate objectives of providing innovative rural energy service models replicable across Colombia.

Under this dimension, CCEP will focus on the early implementation of “quick wins” or low hanging fruit projects based on the knowledge and experience of our local team leaders, supplemented by recently completed or ongoing USAID initiatives. The first tier projects will be chosen on the basis not only of their rapid implementation, but also on their contribution to testing the different aspects of the macro dimension overall RE project development approach. The following chart (Figure 5) illustrates the main activities that we will follow to identify, develop and implement first tier projects.

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Figure 5: Task 2 – First Tier project implementation



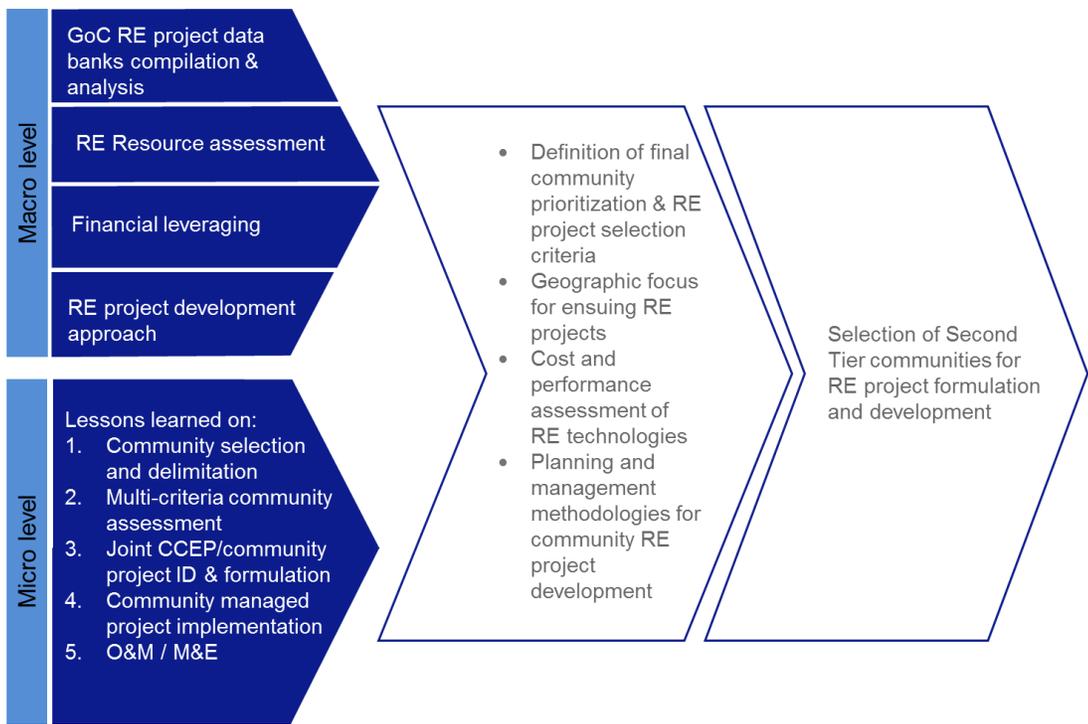
The approach to select first tier projects will be to carry out an initial assessment based on a subset of the criteria being considered for subsequent community projects. For the First Tier, the following subset of factors has been established:

- Potential for obtaining co-financing or ability to attract third party investment (public, private, or community) within CY 2012
- Co-location with previous or current USAID projects
- Potential for development of productive uses of electricity and other energy services
- Opportunities to use biomass, micro hydro or hybrid renewable energy resources
- Existence of community organizations
- Willingness and ability of communities to operate and maintain systems
- Communities located primarily in Chocó, Valle del Cauca, Cauca and Nariño, but may exceptionally be implemented in other regions of interest to current USAID programs and other interested co-financing partners

The following diagram (Figure 6) indicates how both the micro and macro dimensions will feed into the overall CCEP geographic and technological focus for second tier community-based RE planning, implementation and management of projects.

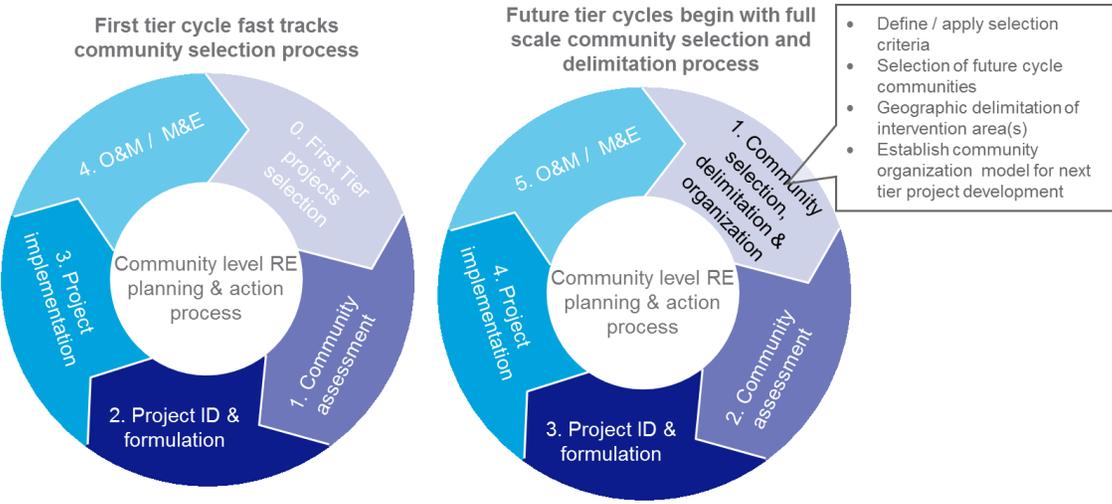
Figure 6: Linkage between the micro and macro levels

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To expand access to productive application of RE resources at the community level, a multi-criteria planning, structuring, implementation and management approach will be developed by CCEP. These criteria combine technical and economic expertise with community organization and participation in all aspects of the project development cycle. For the first tier projects, the geographic locations will be selected based on the viability of fast track implementation or “quick wins” and the CCEP team and GOC partners’ experience. The lessons learned from the first tier projects will support the establishment of a more comprehensive set of project screening, identification, formulation, finance, implementation and management criteria for the rest of the projects.

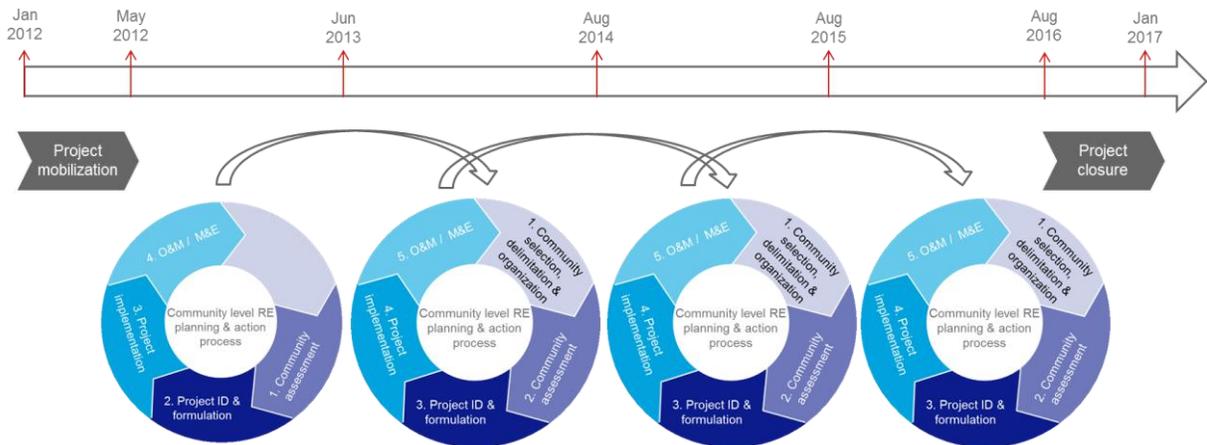
Figure 7: Linkage between the first tier cycle and future tier cycles



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In terms of the life of project planning, this first eighteen month cycle will be the first of four planning cycles; each remaining cycle will incorporate lessons learned from the previous cycle to improve the renewable energy resource project development process as the project is implemented. The diagram below (Figure 8) gives a graphic example of this planning cycle through the 5-year lifespan of CCEP. A more detailed description of the subsequent cycles is provided in the subtask overview section.

Figure 8: Task 2 – Full project cycle



2.3.2 Approach

The CCEP overall approach to promote and construct renewable energy applications in rural communities will be to establish a participatory process for community development with the aid of a multi-disciplinary team. The team will include engineering specialists, economists and community development specialists familiar in working with community-based organizations.

In parallel to the participatory process, a technical process involving RE resource evaluation, analysis of local productive activities, energy demand and supply analyses and forecasts, analysis of energy technology options and costs will be undertaken by CCEP for each locality.

In each locality selected the CCEP field team will work with the community to determine its geographic and economic boundaries in order to assess its energy resources and needs for both domestic and productive activities. CCEP will then introduce the community to the concept of renewable energy applications (appropriate to those needs) gauge their interest in developing an RE project, and assess the resources both monetary and human that the community will be able to contribute or access for the project. The contribution that the CCEP incentive fund can allocate to each project will be explained in detail, emphasizing that no more than 50% of the total value of the project will be

CCEP action in the communities selected for first tier projects will focus on:

- The proven community development approach which has been used by ADAM/ MIDAS in its infrastructure and governance initiatives over the past 6 years,
- The current knowledge of cost analysis methodologies for renewable infrastructure and tariffs for operating and maintaining these systems.
- The methodologies for pre-feasibility studies and economic and financial assessment.

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permitted. Strategically however, CCEP will seek to leverage at least 60% funding from co-financing sources.

Once the community and CCEP agree to move forward, the project team will organize a set of responsible committees to participate in the design, construction and O&M of the project. Using the accumulated experience of USAID MIDAS and ADAM programs, CCEP also proposes to establish three committees in each community (Mesa de Concertación, Comité de Veeduría, Comité Operativo), as explained below. Through these committees, the community will be trained in the identification, formulation, and financial and technical management of the project.

Finally, if appropriate, CCEP will work with the community to organize or strengthen a small /micro enterprise to manage the delivery of the renewable energy produced. It is expected that the community will actively participate in the technical implementation including the design, purchase of materials and RE equipment and the eventual management of the completed system.

The CCEP approach will be guided by two premises, which are described below:

- **Geographic and technological focus** – Given the limited amount of resources available to CCEP, it is clear that both a geographic and technical focus is needed to provide the expected impact and results of the program within the life span of the project. The USAID Mission has assisted in providing this focus. First USAID has encouraged CCEP to link and coordinate its efforts during the first year with other recently completed or ongoing USAID projects. This will allow CCEP to focus in communities which have benefited from USAID organizational and economic development capacity building initiatives and therefore build upon these communities’ proven willingness and capacity to be engaged in this type of projects. Also, linking with other USAID projects will give CCEP the opportunity to leverage other GOC resources not originally identified.

Tier 1 rural energy projects would focus primarily on the western departments of Chocó, Valle del Cauca, Cauca and Nariño, but may exceptionally be implemented in other regions of interest to current USAID programs.

Second, USAID contract emphasizes the promotion of micro-hydro and bioenergy-based generation, and hybrid systems, which further focuses CCEP efforts

Finally, through discussions with USAID, CCEP will locate its rural energy field staff in Cali under the leadership of its renewable energy partner, APROTEC, and it will focus its first tier project activities along the Pacific corridor, though the macro level activities will remain national in scope. This geographic focus gives CCEP the potential to coordinate with the following USAID projects under implementation: ACIP in Choco and Cauca, CELI Central in Cauca if and when its Popayan branch is operational, and BIOREDD along the Pacific Coast. CCEP would also take into consideration ongoing work in CELI North/South, particularly in Nariño.

- **Methodological focus** – Once a community is selected for RE project consideration, the full project cycle will encompass the following activities:
 - Geographic delimitation of community boundaries
 - Community assessment – RE resource evaluation, energy demand and supply assessment and projections, evaluation of local productive activities and economic base, organization of community committees, and mobilization and commitment of financial matching funds

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- Project identification and formulation - Technical design and costing, community decision making and co-finance, final project selection, grant contract to execute and operate the RE project. This activity can extend to providing technical assistance in development of SMEs and business plans for sustainable commercial productive use of RE produced
- Project implementation – Design, purchase and installation of RE equipment, training of community oversight and project management committees
- Operation and maintenance (O&M) and monitoring and evaluation (M&E) – Establishment of project operator (community based or third party), GIS based M&E, establishment of fees collection mechanism, lessons learned and success stories

Because first tier projects will be selected on the basis of prior pre-feasibility assessment and existing community organizations and co-financing partner, some of these activities might not apply strictly to each individual case. However, in each of the four initial projects we will verify if those activities have been correctly conceived and properly designed and dimensioned. From the lessons learned in the implementation of the first tier projects, CCEP will structure a systematic approach to RE community based project structuring and implementation.

2.3.3 Outputs and outcomes

The main outputs and outcomes of this task for the first year work plan are summarized below.

Task 2 Outputs	<ul style="list-style-type: none"> ▪ Initial clean energy project database which will be compiled of existing individual rural energy and other project data banks. This database will be used for the initial selection of the first tier projects and other projects going forward. It will be updated periodically as further information becomes available ▪ Standardized community development approach which will be refined from the successful ADAM and MIDAS participatory models, but adapted for use in rural renewable energy applications ▪ Four Community-scale first tier clean energy projects constructed and in operation with selected projects commercializing the energy produced for productivity activities
Task 2 Outcomes	<ul style="list-style-type: none"> ▪ Four successful clean energy projects serving as models for development particularly for productivity activities ▪ Recognition by other international donors and the GOC of the feasibility of renewable energy industry activity and investment ▪ Expanded network of clean energy project financing ▪ Initial contribution toward meeting GOC energy security and GHG emissions targets

2.3.4 Subtasks overview

a. Expanding access to RE resources at the macro level

The macro level work streams broadly described in the overview section can be further broken down into specific activities described below.

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i. Project data banks development

Under this activity CCEP will compile, analyze and consolidate institutional data banks on rural electrification and RE projects in the ZNI, at any stage of project formulation and development. This will entail reaching out and discussing project portfolios and initiatives with GOC agencies such as IPSE, UPME, FNR, DNP, MADRS, MADR, National Park System, as well as distribution companies ZNI concessionaires and regional and municipal authorities. This data may be complemented from data available through GOC from NGOs, private sector utilities or concessionaires and other international donors such as the Dutch MFE program. For the selection of first tier projects, this subtask will also focus on reviewing and evaluating project information primarily derived from but not limited to previous USAID programs (MIDAS & ADAMS) and from ongoing USAID programs like CELI, ACIP, and BIOREDD). Cross referencing energy and community project listings will be the basis for selecting the first four or first tier projects. Data bank development should not be narrowed to the first four projects and must become an ongoing activity through the program's duration.

ii. Renewable energy resource assessment and mapping

CCEP, jointly with the GOC, will initiate necessary work to develop and complete an assessment of renewable energy resources in rural areas, focusing on small hydro and biomass, and mapping those resources in relationship to un-electrified population centers in a comprehensive database. At a macro level, our GIS expert will review the status and potential usefulness of existing GIS and relevant data sources for CCEP to support macro planning efforts, beginning particularly with the geo-referenced information available in the IPSE and UPME GISs on rural energy and associated layers.

CCEP will work closely with IPSE and UPME to assess data gaps, identify strategies for filling gaps and enable the appropriate institutions to host and develop this database to ensure long term sustainability. The geospatial database will also be used to store and analyze additional community information such as demographic data and potential productive use applications of energy services.

IPSE is already working on the integration of existing solar and wind resource maps into their GIS, so CCEP will initially focus on mapping biomass and mini-hydro resources to complement IPSE's efforts. CCEP will evaluate and select with IPSE and the USAID Mission the need and opportunities to conduct a detailed biomass assessment and a small scale hydro power potential evaluation with HidroSIG, for specific areas of interest in the ZNI (e.g., particular tropical forest or mountainous zones within the Pacific region). By month 15 of this initial work plan, CCEP will jointly review with IPSE and other relevant GOC and USAID initiatives the status of their respective resource evaluations and GIS mapping to identify gaps and needs for further work by CCEP in this area for the next work plan.

iii. Identification of financing resources and institutional mechanisms for RE project promotion at the local levels

Identification of financing resources is not only a critical but necessary requirement that must be addressed at both the broad national level and project specific levels. In this context, CCEP will not only identify National Government sources, but will also seek to interact with the new institutional setup created to promote territorial consolidation primarily in ZNI. CCEP foresees working with the new Unidad Administrativa Especial para la Consolidación Territorial to promote the inclusion of RE in municipal development strategies, plans and budgets as a solution for rural energization. This will

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leave the door open to access and request available funding from the National Government to make projects viable and sustainable.

CCEP will also initiate necessary work to leverage funds to offset the higher initial capital costs of renewable energy technologies and other project development costs. CCEP will initiate dialogues with national programs and financing mechanisms such as FNR, FAZNI, FAER, national budget managed by DNP and Finance Ministry to develop co-financing schemes for rural energization projects to be developed under this program.

CCEP will work to establish innovative financing schemes that blend public, private sector, NGO and community funding with donor funding. USAID funds can be applied to cost-sharing of specific projects but will not be used to cover more than 50% of total project costs. Specific guidelines for attracting and calculating project cost share will be developed by CCEP and presented to USAID for review.

iv. Development of RE project planning and implementation methodology

CCEP will develop a systematic approach to RE community-based project structuring and implementation, which entails establishing a rural energization identification and implementation methodology that will define the roles of social and institutional actors as well CCEP's technical and community development teams. This methodology will delimit areas of interventions, and will evaluate the local economic base, local energy resources and energy demand. The rapid assessment of all these factors will allow CCEP teams and its social and institutional partners in the communities to identify specific opportunities for RE solutions specifically designed to enhance their productive capacity and social wellbeing.

In developing the methodology, CCEP will test and evaluate the practicality of using RE planning software such as RETScreen, HOMER or other similar tools for RE resource evaluation. CCEP will also assist IPSE and UPME to develop standardized financial and economic renewable assessment methodologies, which provide mechanisms for screening additional renewable energy project over the life of the project.

v. Capacity building for rural energy SMEs and MFIs

CCEP will start planning how to provide enterprise development services to rural and clean energy entrepreneurs involved in the development, design, installation, operation, and maintenance of rural renewable energy systems. Support will include technical training or business development skills. Technical assistance will be provided to financial institutions to expand enterprise or consumer financing for household or community scale renewable energy systems.

Capacity building efforts will initially focus on the four first tier infrastructure projects to be constructed in rural communities, as an input in the design of future community participation strategies. It will start from the beginning of the project as active community involvement will be encouraged during project assessment and implementation. The community's hands on participation during the construction phase will familiarize them with the technology implemented and give them practical tools to troubleshoot system operation and management. Furthermore, a series of training and technical assistance initiatives will be planned and implemented to prepare the community through committees and individual efforts to maintain and operate the system. This will include

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financial management, collection for services, bookkeeping, and organizing micro enterprises to manage the systems.

After the implementation of the four first tier projects, CCEP will evaluate the four projects and develop a list of lessons learned, which will guide future CCEP implementation and the training and technical assistance provided to communities for infrastructure project implementation, community participation, and commercialization of renewable energy systems.

Finally, as of month 12, CCEP will begin to work with financial institutions other than those directly involved in first tier projects to promote renewable energy applications as a viable financial investment and convince them of the value of investing in similar projects. The first tier projects will provide actual economic data on the economic and financial feasibility of these efforts.

vi. Transaction support

CCEP will start planning how to provide all stages of transaction support including pre- feasibility studies, bankable feasibility studies, and independent transaction advisors to facilitate the development of off-grid renewable resources. This also will entail establishing specific rules and conditions for applying for finance from the Incentive Fund and the recipients' responsibilities and commitments for the use of those funds.

In addition, CCEP will conduct the following work:

- Work closely with UPME and IPSE to develop methodologies for systematic cost analysis of renewable and hybrid energy sources as part of their standard operating procedures
- Prepare a list of indicators such as geographic location, population density and system configuration as well as the value in linking productive activities with renewable energy utilization.

vii. Impact Evaluations

CCEP will also start planning how to undertake evaluations to quantify the impact that rural energization has on a number of key factors such as economic growth and job creation, education, conflict reduction, and improved health service delivery. Baseline studies will be planned for selected communities to provide before and after comparisons, and randomized evaluation methodologies that could be used to compare communities with and without access to electricity and other energy services.

During the current work plan, a GIS-based monitoring and evaluation system will be designed developed for implementation in each of the 80 community projects, covering the geo-referencing of all RE installations and end-users, the RE resources mapping, and the economic activities of the community. This system will be used to report project performance indicators such as hours of service, cost recovery, O&M costs, number of households and individual beneficiaries, etc.

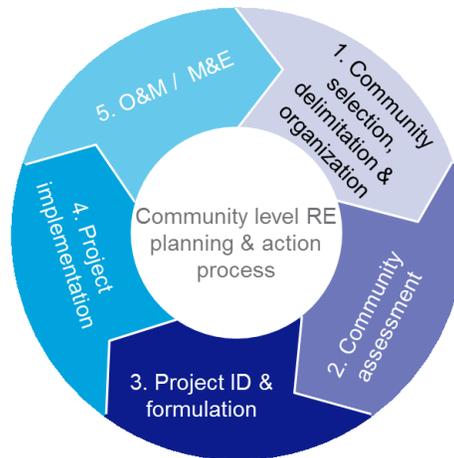
For the first tier projects, CCEP will focus its evaluation on the methodologies, instruments and tools used to implement the projects, which will help CCEP improve the process and enhance the potential results of future projects. The rest of the projects will include this dimension, together with the impacts related to energy use, climate change and economic growth expected from the projects.

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b. Expanding access to RE resources at the micro level

At the micro level, the current work plan focuses primarily on the first tier projects. The first tier projects will serve as the setting for applying CCEP’s community organization, outreach, and education instruments. Our community development approach involves working with communities and local NGOs and other key stakeholders from the outset. The communities and stakeholders will be involved in each of the five steps of the project cycle shown in the diagram below, and the project will provide the training and capacity building to establish community organization to interface with an energy service provider or to manage the energy service via a community cooperative.

Figure 9: Task 2 – Project cycle



i. First tier community selection and organization

The first action will be selecting the communities for RE project development based on the following criteria:

- Leveraging funds from GOC and other donor projects within CY 2012
- Linking the project with communities identified by other USAID supported projects such as
 - ACIP (Choco and Cauca)
 - BIOREDD (Northern Choco and Buenaventura)
 - CELI Central (Cauca)
 - CELI North and South (Nariño)
 - MIDAS (PYME, TEP and CFC project locations in the Pacific corridor¹)
 - ADAM (project locations in the Pacific corridor)
- Potential to support for productive activities in the community
- Focus on biomass and micro hydro or hybrid renewable energy resources
- Willingness and ability of communities to operate and maintain systems

¹ Commercial Forestry/Natural Forest Conservation (CFC), Small and Medium Enterprises (PYME), and Productive Ethnic Territories (TEP).

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- GOC information on rural communities currently not served and technically or economically not feasible to connect to electrical grids within the foreseeable future, as assessed on a case by case basis.

Once the first tier project sites are selected, CCEP will begin to work with individual communities through a community participatory process which will develop their capabilities to get the project off the ground, monitor and/or implement it, as well as prepare the community to operate and maintain the project once it is constructed.

CCEP through its Community Development Specialist and Field Engineer will lead in the organization and support to solicit community input and participation in the organization and support through a series of committees (Mesa de Concertación, Comité Veeduría, and Comité Operativo). At the community assessment stage the Mesa de Concertación or community assembly will constitute the vehicle to present the CCEP initiative and determine the communities' interest.

ii. Multi criteria community assessment

CCEP will undertake the technical studies required to structure viable and sustainable renewable energy solutions at the community level with close interactions with the community committees mentioned above. The dimensions to be assessed in each location will include at least the following:

- Co-financing search – to expedite this process and due to the fact that the current GOC support for activities may be difficult because of the deadlines for submitting concept papers or project designs, the focus for co-financing will be on detecting and mobilizing existing budget lines in municipalities, community based groups, international donors, private enterprises or associations, and other interested stakeholders.
- Gather detailed information on the economic, social, infrastructure, and governance conditions in the region and community
- Conduct a RE resource assessment and mapping exercise to identify potential renewable energy resources at the community level
- Establish current and potential energy demand and supply for household and productive activities within the zones of project interventions

iii. Project identification and formulation

The Renewable Energy Resource Specialist and Field Engineer will formulate a renewable energy infrastructure project with the community based on:

- The preceding resource assessment, energy supply and demand profile and projections,
- an assessment of local productive activities which might benefit from the use of RE technologies
- The feasibility of co-financing and community willingness to implement the project.

At this stage, CCEP will develop a sufficiently detailed technical and economic feasibility study to attract co-financing partners and submit it to the Mesa de Concertación for feedback, approval and commitment. Once the community and institutional partners have given green light to the RE project, CCEP will enter into a grant management agreement with the community and develop a detailed design and budget of the RE installations, implementation costs and the expected costs of O&M.

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The community development specialist will also contribute to the identification and formulation of commercially viable productive use applications of renewable energy and, together with the engineering team and community, identify financial vehicles and institutional backing for improvement of these productive activities. Within regulations and limits to be established, CCEP could co-finance energy use equipment such as motors, refrigeration units, and solar driers. as part of the RE project.

iv. Project implementation

Once the community development process is sufficiently advanced, and the RE project sufficiently detailed, CCEP and the community will jointly begin the technical implementation of the RE solution by focusing on the purchase of materials and RE equipment and the construction of the facilities. It is expected that this activity will also include active participation of the selected communities with the support of our RE specialists.

At this point, the community oversight committee (Comité de Veeduría) will take charge of budget management including hiring and paying all contractors and material, and monitoring and controlling all project expenditures.

v. Project O&M and M&E

The final phase of the cycle involves both the community and the CCEP technical staff in different but parallel work streams. On one hand, the community, municipality, or the third party service provider must undertake the operation and maintenance of the project, and possibly productive use equipment, on a continuous basis. On the other, CCEP must undertake systematic monitoring and evaluation of project outcomes and impacts. This phase entails:

- Training in operation and maintenance – The entire field team will participate in this training led by the Community Development Specialist. The team will work with the community and municipality, where appropriate, to develop a training program for the operation committee to develop their capacity to manage and maintain the renewable energy system. This will include developing financial management training, preparation of tariffs and process for collection for services, and possibly the organization or strengthening of a local micro enterprise to manage the system in the long term.
- In addition to formal training, the CCEP technology specialist and/or field engineer will conduct follow-up visits over a six-month period to assure the system is operating properly and that it is being well managed from the technical and administrative perspectives.
- For the first tier projects, it is possible that the full scale GIS-based monitoring and evaluation system to be developed and implemented in each community might not be fully operational. However, CCEP will geo-reference all RE installations and end-users, map the RE resources evaluated, and map the economic activities of the community. Once the GIS-based M&E system is fully operational, it will also be used to report project performance indicators such as hours of service, cost recovery, O&M costs, number of households and individual beneficiaries, etc.

c. ***Gantt chart***

The Gantt chart included below indicates that the activity associated with expanding access to RE resources at the macro level starts early in the period, focusing on the generation of projects data

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bank as the main initial activity. Closely following this activity, CCEP team will undertake the initial work associated with the identification of financing resources and institutional mechanisms for RE project promotion at the local levels. CCEP will also develop the RE project planning and implementation methodology that will serve as a foundation for the following years. Almost in parallel to those activities, CCEP team will also start addressing the issues associated with assessing and mapping renewable energy resources.

Capacity building for rural energy SMEs and MFIs will also be initiated once the some of the activities described above have moved forward to allow the CCEP team to focus its training and capacity building efforts on a preselected subset of targeted SMEs and MFI. These efforts will be focused on training services provided to rural and clean energy entrepreneurs involved in the development, design, installation, operation, and maintenance of rural renewable energy systems.

The transaction support and impact evaluations will be carried out during the second portion of the first year period. It will benefit from the activities and lessons learned from the RE resource development at the community level which, as described in the subtask section, will be an important area of CCEP work during the first year work plan.

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2.3.5 Roles and responsibilities

This task will be led by Colombian renewable energy group, APROTEC, which has over 20 of years designing and implementing rural renewable energy initiatives, and Tetra Tech ARD which has supported municipal government and community based organization to improve their capacities to organize, build and maintain infrastructures projects ranging from productive infrastructure to school construction to electrical generation and water systems. CCEP will promote linking of renewable energy applications to productive economic and social development to more efficiently utilize the renewable energy resource and help to assure sustainability.

The CCEP rural renewable applications field team will be located in Cali. The team will consist of:

- Renewable Energy technology specialist, Jesus Gomez, will coordinate responsibilities and direct activities regarding RE project assessment and field work related to task 2. Will take the lead in the overall design of the renewable energy project, survey potential of the renewable energy resources, help in the identification of productive use of the energy generated and be the primary author of the O &M manual as well as conducting technical training
- A Task Coordinator will assist Team leader in overall design of RE projects, will be available to visit local communities to survey local RE resources, and will contribute in screening activities
- On site renewable energy assessment will be conducted through two RE specialists: a Hydro Specialist and a Biomass Specialist. They will visit potential communities and conduct resource assessment. They will also submit a technical and economical (first stage) proposal and suggest productive uses and will also be involved in technical training and system O&M. This task will be supported by US short-term technical specialists.
- Community Development Specialist (Igor Rodriguez) – will be the primary point of contact with the community and take the lead in the introduction of the project to the community, establishment of community oversight committees and organize and manage the capacity building activities at the community level
- Field Engineer – Assist the RE Technology specialist with design and construction of the project and participate in technical training for the community
- Monitoring and Evaluation Specialist (intermittent technical assistance) – working with the field team and the Central Office staff in Bogota develop baseline information in conjunction with the USAID contractor. Once established, this specialist will work with field staff and communities to gather needed energy use data, economic development, training received, and beneficiaries of renewable energy

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2.4 TASK 3 - ENERGY EFFICIENCY AND RENEWABLE ENERGY INVESTMENT PROMOTION

2.4.1 Overview

The primary objective of Task 3 is to implement interventions to catalyze industry/enterprise investments in RE/EE through a combination of project development, financing facilitation, and technical and business advisory services/technical assistance. This activity will provide technical assistance and training to enable companies to bring projects to financial closure and support project sustainability and replication.

This task will focus primarily on small- and medium-size enterprises and industries, although CCEP will also consider large facilities that can have replication potential and RE projects in areas of interest to USAID and the GOC. Target industries/companies will be identified based on: (i) economic viability of RE/EE investments; (ii) potential impact of RE/EE investments in terms of energy reduction and cost-savings; (iii) potential for a demonstration effect, information-sharing, and replication among similar facilities/companies (e.g., through an industrial association; with industries that are physically clustered); and (iv) complementarity with other donor activities or with specific financial credit lines for EE investments available through national banks and other organizations.

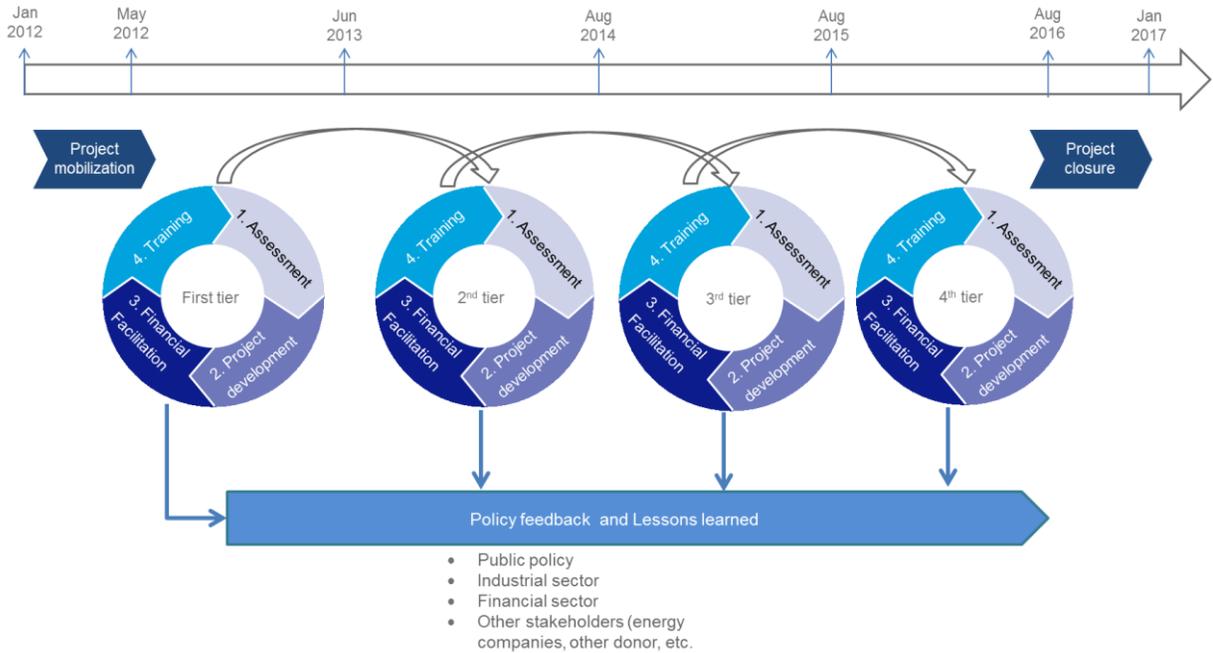
Tt and CNPMLTA are well situated to direct programs and facilitate investment for a large portion of this potential. CNPMLTA will function as CCEP's project development facility, assisting industries and project developers in accessing existing local financing mechanisms and working with local FIs to develop new mechanisms to fund EE and RE projects in the industrial sector. The experience gained in this context will provide lessons learned and groundwork for others local institutions to consider the provision of these types of services.

Closely linking to Task 1, we will identify renewable energy (RE) and energy efficiency (EE)/cleaner production (CP) investment opportunities in key sectors, work with several funds and credit lines to develop new mechanisms to fund EE/CP and RE projects, and offer training and advisory services to financial institutions and industries. Studies show that more than 220 million MT CO₂e in combined emissions reductions can be achieved across all sectors of the Colombian economy in 20 years.

In terms of the overall approach, the Task 3 team will go through a series of successive cycles involving assessment of EE/RE/CP potentials in specific industrial sectors and subsectors; project identification and selection; financial facilitation; and training, outreach and advisory services. The graph below illustrates the work plan structure as a series of successive loops representing each of the tiers for the total duration of the project. The following diagram indicates that the subtasks within each tier do not necessarily follow a linear structure, but instead overlap and provide constant feedback to the other subtasks, and the process is repeated during each tier following a brief period of evaluation and reorganization of the structure at the end of each tier.

Figure 12: Task 3 – Full project cycle

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The Task 3 team will provide technical insights, empirical data and outreach activities to enhance the overall contributions by CCEP to the development of EE strategies and policies at the national level. The practical lessons learned from each cycle will be focused towards providing empirical evidence and advancing innovative EE/RE/CP policy formulation by relevant public sector stakeholders, industrial enterprises, financial institutions, energy companies and other interested parties.

In each cycle a series of specific projects will be identified and developed with the support of the CCEP team and the lessons learned will be documented to serve as basis for the continued development of the project. This way the team will regularly be able to assess the results and performance of the project and adjust for future identification, assessment and implementation of projects during the four tiers of the project.

An immediate priority for the first year work plan is to develop a specific set of rules for the allocation of the incentives through grants contracts to support the industrial EE/RE projects identified under this task.

2.4.2 Overall approach

The first year work plan involves the identification of key industrial subsectors and/or cross cutting technologies within which initial EE/RE projects will be identified to serve as models for demonstration and replication. As a contribution to the development of the Colombian LEDS and NAMAs under construction by the Government of Colombia, CCEP will develop corporate GHG emission inventories for some of the identified companies in which projects may be implemented.

Upon identification of potential “first tier” projects, based on defined eligibility criteria, CCEP will develop business and/or investment models that will serve as templates for future project evaluation and help facilitating project replication. CCEP will support selected projects will also be supported in the identification of and access to appropriate local financial mechanisms. Also, CCEP will work with

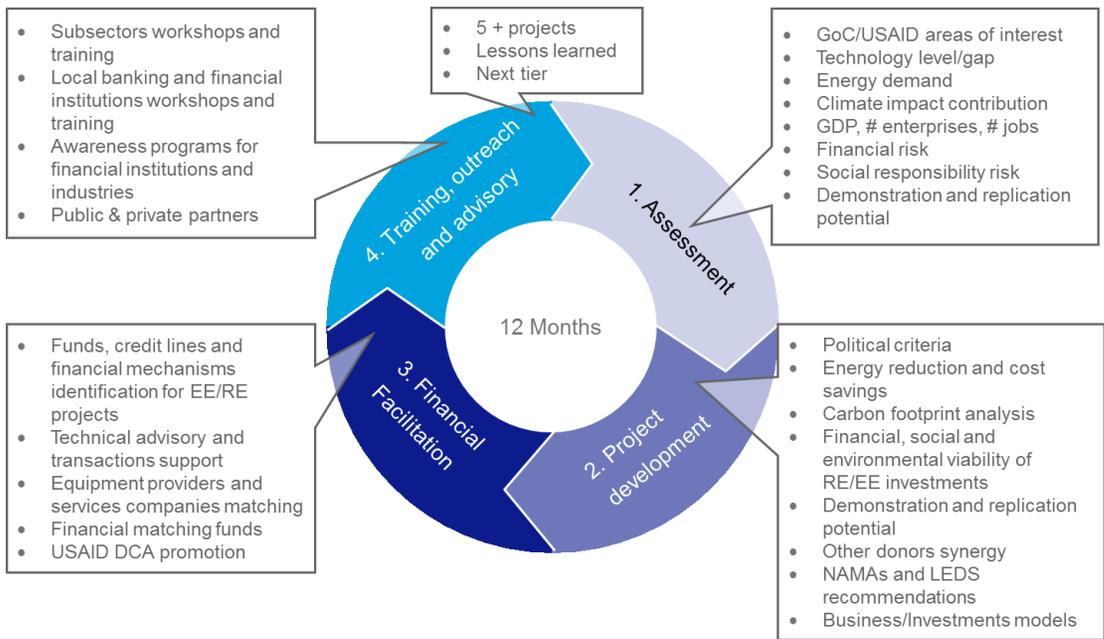
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financial institutions to support the development of financial mechanisms (or adapt existing ones) aimed at implementing EE/RE projects.

Based on the identified subsectors and projects and the information gathered during the project identification and evaluation activities, CCEP will implement training programs to build the capacity of the industrial subsectors selected, as well as the associations where they are members; CCEP will identify and evaluate EE/RE projects based on the information from each subsector’s potential and technological gaps. Training will also be given to financial institutions to enhance their capacity to understand and correctly assess EE/RE projects based on their technical characteristics, an environmental and economic benefits and risks, which will facilitate the communication between them and their industrial clients

For each annual work plan, the process explained above can be depicted in the diagram shown below (Figure 12), which will guide the project team’s work throughout the various cycles of project assessment and implementation. A more detailed description of the activities entailed is presented in the subtask section.

Figure 13: Task 3 – Project assessment and implementation cycle



As for the first tier of energy efficiency projects, they would be focused primarily on the major industrial and agro-industrial corridors in Antioquia, Atlántico, Bolivar, Cordoba, Boyacá, Cundinamarca, Santander Eje Cafetero and Valle del Cauca.

The team will work with the industrial sector, associations and companies to identify and assess subsectors with potential EE/RE projects based on pre-established criteria for each cycle. The initial criteria chosen for the development of the first cycle of EE/RE/CP projects are:

- USAID areas of interest, mainly urban or rural areas with consolidated industrial activity.

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- GOC (e.g. MADS and UPME) sectors of interest based on the ongoing definition of national LEDS, NAMAs and PROURE.
- Subsector characteristics, e.g. energy demand, climate change contribution, production dependency on fossil fuels (e.g. GDP-GHG ratio), state of the technology, contribution to the Colombian economy, financial, social and environmental risks, among others.
- Potential of demonstration and replication.

These criteria may be expanded or modified in subsequent work plans as feedback from project implementers, GOC and USAID generated and duly considered by the CCEP team.

2.4.3 Outputs and outcomes

Task 3 Outputs	<ul style="list-style-type: none"> ▪ Subsectors and technologies assessment ▪ EE/RE opportunities by subsector ▪ Definition of bankable projects ▪ 5+ first tier industrial EE/RE projects ▪ Business/finance models for project evaluation ▪ Training for financial institutions, industrial associations, among other relevant stakeholders. ▪ Training and educational material for EE/RE project evaluation.
Task 3 Outcomes	<ul style="list-style-type: none"> ▪ Successful EE/RE projects serving as models for development ▪ Expanded EE/RE industry activity and investment ▪ Expanded network of EE/RE project financing ▪ Contribution toward meeting GOC energy security and GHG emissions targets

These contribute towards the achievement of the indicators defined in the Performance Management Plan:

- Indicator 4.4.1-28 Number of people receiving USG supported training in clean energy related topics
- Indicator 4.8.2-18 Quantity of operational renewable electricity generation as a result of USG assistance, disaggregated by solar, hydro, wind, other.
- Indicator 4.8.2-20 Energy saved due to energy efficiency/conservation projects as a result of USG assistance.
- Indicator 4.8.2-23 Number of clean energy tools, technologies, and methodologies

2.4.4 Subtasks overview

A multi criteria analysis will be performed by assigning values of importance to each of the defined criteria as a quantitative and qualitative method for company/project selection. Given the potential for implementation of EE and RE projects, and their importance in the Colombian economy, the possibility to assess projects within other sectors (e.g., tourism and commercial buildings) could also be considered.

a. Industrial subsector and/or technology assessment

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The assessment of strategic industrial subsectors or target technologies will require intensive communication with stakeholders such as industrial associations, financial institutions, Ministry of Mines and Energy, Ministry of Environment, UPME, energy service providers, utilities, academia, among others. For the first tier projects, this process began during project mobilization and will continue through the second quarter of CY 2012.

A compilation of statistical data, literature and publications by relevant national authorities and international sources has been undertaken and its review and analysis will be completed to determine the results and recommendations of previous (recent, if possible) studies on sector and subsector energy demand and performance, technological aspects, gaps and setbacks, economical aspects, and nationally prioritized areas. Also, cross cutting technologies (e.g. boilers, cogeneration, etc.) practices and specific actions which can be applied to a wide range of industries and may be easily replicable will be discerned.

At the beginning of each year's work plan, a new assessment will be made to determine the subsector and technologies to be focused on the definition of subsequent targets (subsectors, companies, technologies).

b. Identification of target industries/companies and project development

Based on the results from the subsector and technology assessment, CCEP will identify potential projects by direct contact with subsectors through associations and/or directly with companies which may be interested in project implementation. CCEP will conduct meetings and site visits to obtain firsthand information on energy demand, performance, production, costs, technology used, and all the necessary data for project evaluation. Upon demonstration of interest to participate in the project by the companies, CCEP will conduct an assessment of the technical and economic potential of each project.

Significant synergy potential has been identified with:

- Bancolombia, which has recently begun to operate a US\$110 million environmental sustainability credit line focused mainly on energy
- ISAGEN, which is one of the most important power generators in Colombia and has an array of big industrial customers with which it has been working to identify potential energy saving opportunities. Throughout CY 2011, thirty one of its clients identified potential for energy savings and are ready to move forward with specific EE project evaluation.
- Empresas Públicas de Medellín, which has shown interest in participating in projects that involve renewable energy generation from biomass

Discussions with each of these enterprises are underway to identify specific industrial and agro-industrial sector and companies for which CCEP can provide technical and transactional support through first tier EE/RE projects. The identification of individual projects will be based on the following criteria:

- Energy efficiency and cost savings.
- Contribution to climate change (GHG inventories may be realized for some companies).
- Financial, social and environmental viability of RE/EE investments.
- Demonstration and replication potential.

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- Synergy with other financing or aid mechanisms.
- Colombian NAMAs and LEDS recommendations.

Following the definition of potential subsectors and technologies, CCEP will identify individual companies and will assess the technical and economic viability of specific projects within those companies.

CCEP will also design business/investment models and/or templates to evaluate similar projects across the specific subsector or technology to be implemented.

c. Technical and financial facilitation of selected projects

CCEP will identify technology providers and engineering consultants that could be interested in providing equipment and/or services. The team will work jointly with the company and technology providers in the identification and selection of the technological alternative that better suits the needs of each individual project.

CCEP will identify financial institutions that offer services and products related to EE/RE projects , and make a characterization of the differences, similarities and applicability of the different financing mechanisms identified in each FI to provide a frame of reference for the selection of financing alternatives for the selected projects or companies.

CCEP will then present interested companies with the available financing opportunities, and conduct assessments based on the financial aspects of each company and specific project. The field team will work to facilitate communication between banks and companies to aid in the understanding of the technical and financial aspects by all parties involved.

CCEP will support feasible projects to obtain funds from national and international financing mechanisms, as well as with the evaluation of incentives which might aid project implementation (e.g., sales of carbon credits and tax incentives). CCEP will also promote partial loan guarantees using the USAID Development Credit Authority and/or other appropriate guarantees funds.

Finally, CCEP will identify international sources of financing aid that may provide additional funding and help improve the potential of implementation for not so profitable investments (e.g. Clean Development Mechanism or voluntary carbon markets). CCEP will conduct an assessment of the eligibility of projects to access these financial resources based on the conditions of each financing scheme and recommendations will be issued accordingly.

d. Training, outreach, and advisory services

Based on previous experience, but also on lessons learned from the previous subtasks, training objectives and strategies will be designed not only to address the gaps in technological and operational knowledge that might be identified for selected subsectors and/or technologies, but also to disseminate information on financial vehicles available for EE/RE investments for these subsectors and /or technologies.

CCEP will organize training and dissemination workshops with sector or subsector associations, CCEP will organize training and dissemination workshops with sector or subsector associations, professional

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associations, chambers of commerce, energy service providers or other interested parties. These workshops and trainings shall coincide, when possible, with the implementation of previously defined projects, to enhance the possibilities of demonstration.

CCEP will focus its training efforts at two main target audiences: a) financial institutions with the objective of improving their understanding about EE/RE projects in the identified subsectors, including technological, financial, economic, social and environmental aspects and b) technology centers and specialized consulting groups with the objective of improving their understanding about financial vehicles, bankable project formulation and marketing of EE/RE solutions to industrial customers.

All training will be complemented by the development of training and educational material that will serve as reference for future projects evaluation by subsectors, companies and financial institutions alike. These materials will include case studies on environmental and economic benefits, understanding of technologies and the risks associated with them, and technical and financial analysis among other key topics.

CCEP will carry out training and capacity building activities at different times in each cycle (as opposed to concentrated at the end of each cycle) to take advantage of existing and/or already identified relations and synergies with involved stakeholders, such as the credit lines already implemented by SECO and Bancolombia, CNPMLTA's technical partnership with ISAGEN.

2.4.5 Roles and responsibilities

Task 3 will be led by CNPMLTA, with 14 years' experience working with the Colombian industrial sector in the identification and implementation of cleaner production, resource efficiency, energy efficiency and renewable energy, among others, together with TetraTech's internationally experienced staff.

The EE/RE/CP team will be composed of:

- Team leader, energy efficiency technology specialist – will coordinate responsibilities and direct activities in general.
- Energy and GHG emissions specialist - will perform subsector, companies and project assessments.
- Cleaner production specialist - will perform subsector, companies and project assessments.
- LCA and GHG inventories specialist - will conduct corporate GHG emission inventories for selected companies.
- Financial evaluation of projects specialist - will aid in the selection of financing alternatives and provide guidelines for definition of bankable projects.
- Field engineer - will conduct on-site visits and data collection for project assessments.
- Local and US short-term technical assistance on technology and engineering.

The team will be coordinated by CNPMLTA technical director Carlos Fernando Cadavid and will perform all of the described subtasks, with the support and supervision of COP José Eddy Torres from Tetra Tech Bogotá. The team will work from Medellín and travel to defined locations for on-site visits, meetings, conferences, workshops, and all project related activities.

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2.4.6 Gantt chart

As indicated in the Gantt chart shown below, the CCEP team will focus on the initial assessment of the industrial subsector and/or technologies during the first four months of the project through a detailed evaluation of available information of industrial subsectors and specific technologies.

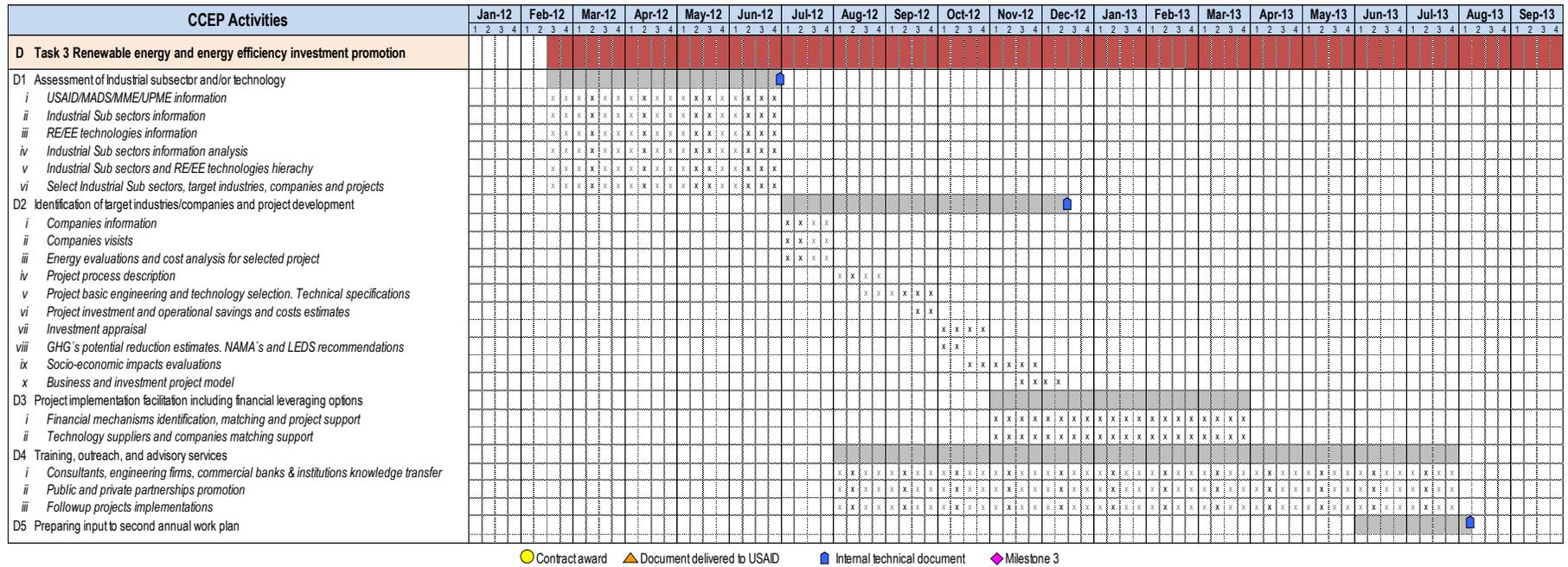
Once this is completed the CCEP team will focus on the identification of target industries/companies and project development during the last portion of CY 2012 by carrying out energy evaluations and cost analysis for selected project as well as addressing basic engineering including technical specifications and calculating investment and operational savings and costs estimates. CCEP will generate other project specific estimates, including GHG's potential reductions, socio-economic impacts and NAMA's and LEDS recommendations. At the end, CCEP will develop a business and investment project model.

It is expected to initiate work associated with project implementation facilitation including financial leveraging options in late CY 2012, which will include identification of financial mechanisms and other project support from technology suppliers and other stakeholders.

The CCEP team will start as early as July 2012 to provide training, outreach, and advisory services to consultants, engineering firms, commercial banks & institutions and to promote public and private partnerships. It is expected that this training and knowledge transfer activity will span for about 12 months.

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Figure 14: Gantt chart - Task 3



APPENDIX A: CCEP GANTT CHART

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CCEP Activities	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
A Initial mobilization, coordination and reporting																						
A1 Coordination with USAID and Mobilization of CCEP team	●																					
A2 Kick-off meeting with USAID Bogota & initial working sessions with USAID's COR																						
A3 Presentation of CCEP program & initial technical meetings: UPME, MME, MADS, IPSE																						
A4 Initial meetings to coordinate with other USAID projects (CELIs programs, ACIP, etc.)																						
A5 Development of Incentive Fund and grants manual			▲																			
A6 Development of procurement plan			▲																			
A7 Development of draft first year work plan, PMP, EMMP			▲																			
A8 Preparing quarterly reports				▲				▲					▲								▲	
A9 Preparing quarterly calendar year financial status report					▲					▲				▲							▲	
A10 Preparing second annual work plan																					▲	
B Task 1 RE & EE enabling environment and institutional capacity development																						
B1 Renewable energy project evaluation & development methodologies																						
B2 Technological tools for information management																						
B3 Technical assistance in achieving, complementing & monitoring PROURE EE targets																						
B4 Support to GOC's capacity to develop LEDS process																						
B5 Support in overcoming regulatory and financial barriers																						
B6 Preparing input to second annual work plan																						
C Task 2 Expanding access to renewable energy sources in unserved areas																						
B1 Expanding access to RE resources at the macro level																						
i Project data banks development																						
ii Renewable energy resource assessment and mapping																						
iii Identification of financing resources and institutional mechanisms for RE project																						
iv Development of RE project planning and implementation methodology																						
v Capacity building for rural energy SMEs and MFIs																						
vi Transaction support																						
vii Impact Evaluations																						
B2 Expanding access to RE resources at the community level																						
i Rural RE team organization and first tier community selection																						
ii Community organization																						
iii Multi criteria community assessment																						
iv Project identification and formulation																						
v Project implementation																						
vi Project O&M and M&E																						
B3 Lessons learned and input to second annual work plan																						
D Task 3 Renewable energy and energy efficiency investment promotion																						
D1 Assessment of Industrial subsector and/or technology																						
i USAID/MADS/MME/UPME information																						
ii Industrial Sub sectors information																						
iii RE/EE technologies information																						
iv Industrial Sub sectors information analysis																						
v Industrial Sub sectors and RE/EE technologies hierarchy																						
vi Select Industrial Sub sectors, target industries, companies and projects																						
D2 Identification of target industries/companies and project development																						
i Companies information																						
ii Companies visits																						
iii Energy evaluations and cost analysis for selected project																						
iv Project process description																						
v Project basic engineering and technology selection. Technical specifications																						
vi Project investment and operational savings and costs estimates																						
vii Investment appraisal																						
viii GHG's potential reduction estimates. NAMA's and LEDS recommendations																						
ix Socio-economic impacts evaluations																						
x Business and investment project model																						
D3 Project implementation facilitation including financial leveraging options																						
i Financial mechanisms identification, matching and project support																						
ii Technology suppliers and companies matching support																						
D4 Training, outreach, and advisory services																						
i Consultants, engineering firms, commercial banks & institutions knowledge transfer																						
ii Public and private partnerships promotion																						
iii Followup projects implementations																						
D5 Preparing input to second annual work plan																						

● Contract award ▲ Document delivered to USAID ■ Internal technical document ◆ Milestone 3

