



PROJECT IDENTIFICATION FORM (PIF)¹

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

PART I: PROJECT IDENTIFICATION

Project Title:	Securing energy efficiency in the Ecuadorian residential and public sectors (SECURE)		
Country(ies):	Ecuador	GEF Project ID: ²	5114
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5150
Other Executing Partner(s):	Ministry of Electricity and Renewable Energy (MEER)	Submission Date:	17 Jan. 13
GEF Focal Area (s):	Climate Change	Project Duration(Months)	36
Name of parent program (if applicable): ➤ For SFM/REDD+ <input type="checkbox"/>		Agency Fee:	US\$ 168,766

A. FOCAL AREA STRATEGY FRAMEWORK³:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust fund	Indicative Grant Amount	Indicative Co-financing
				(\$)	(\$)
CCM-2	Appropriate policy, legal and regulatory frameworks adopted and enforced	Energy efficiency policy and regulation in place	GEFTF	858,302	600,000
	GHG emissions avoided (outputs 3.1-3)	Energy savings achieved	GEFTF	838,000	22,777,600
Subtotal				1,696,302	23,377,600
Project Management cost				80,182	260,000
Total project costs				1,776,484	23,637,600

B. PROJECT FRAMEWORK

Project Objective: To increase the share of energy-efficient electric appliances and lighting in the residential and public sectors.

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-Financing (\$)
1. Governance and Legal Framework on the Use of EE Appliances	TA	A conducive governance and legal framework for adopting the use of EE appliances by the residential and public	<ul style="list-style-type: none"> Amendments to laws, by-laws and resolutions have been proposed for legislation in accordance with the National Energy Plan for the residential and public sectors to promote the use of energy efficient appliances and phase out 	GEFTF	208,302	425,000

¹ It is very important to consult the PIF preparation guidelines when completing this template.

² Project ID number will be assigned by GEFSEC.

³ Refer to the reference attached on the Focal Area Results Framework when filling up the table in item A.

		sectors is approved and enforced.	<p>obsolete equipment .</p> <ul style="list-style-type: none"> • Specific energy performance criteria have been integrated into the procurement procedures of the central and local governments. • Financial incentives have been designed and implemented to stimulate the purchase of EE household appliances not covered by government substitution programmes. • Socio-economic information and energy consumption data for the residential sector has been updated and analyzed as input for tailored EE market introduction programs. • Market issues, including import mechanisms, parallel imports, pricing mechanisms, and second-hand markets, have been analyzed and recommendations issued. 			
2. Enhancement of Technical Capacities on EE Standards Enforcement	TA	New household appliances on the market meet established energy efficiency performance standards.	<ul style="list-style-type: none"> • Technical facilities of accredited national laboratories have been equipped to effectively implement energy performance tests on household appliances. • Technical standards on the energy performance of washing machines and air conditioners (RTE 2495) have been developed and implemented under supervision of INEN. • Staff from laboratories and professionals from sales companies, manufacturers, and electricity distributors have become skilled on the application of EE standards for household appliances. • Technical guidelines and accreditation procedures for sector agents (test laboratories; recycling companies; suppliers of EE services and equipment) have been updated. 	GEFTF	650,000	175,000
3. EE Household Appliances Utilization	INV	3. Obsolete and energy inefficient household appliances are phased out and replaced with energy efficient units	<ul style="list-style-type: none"> • A refrigerator substitution program is fully under implementation, delivering a target volume of 42,000 household refrigerators to eligible beneficiaries in its initial phase. • Recycling companies and sector agents are equipped and trained to guarantee the efficient, environmentally responsible removal of obsolete equipment from the market, including the recycling and/or destruction of GHG refrigerants. • Residential customers have become aware on the benefits of EE appliances through a promotional campaign implemented in coordination with sector associations (ALBE), manufacturers and sales companies. 	GEFTF	838,000	22,777,600
Project Management Cost ⁴				GEFTF	80,182	260,000
Total Project Costs					1,776,484	23,637,600

⁴ Same as footnote #3.

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Co-financing for baseline project	Name of Co-financier	Type of Co-financing	Amount (\$)
National Government	MEER	Grant (cash)	9,660,000
National Government	MEER	Soft loan (cash)	12,927,600
National Government	MEER	In-kind	1,000,000
Multilateral agency	UNDP	Cash	50,000
Total Co-financing			23,637,600

D. GEF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹: N.A.

¹ In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table

² Please indicate fees related to this project as well as PPGs for which no Agency fee has been requested already.

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1.1. The GEF focal area strategies: Climate Change

The objective of the Project is to increase the share of energy-efficient electric appliances in the residential and public sectors, building forth on a series of Government-led substitution programmes that are presently being implemented and/or prepared in the country. The proposed UNDP/GEF project “*Securing energy efficiency in the Ecuadorian residential and public sectors (SECURE)*” will enhance ongoing activities by focusing on the efficiency and capacity of involved sector institutions, including test laboratories, accreditation institutes, ministries (including MEER and MIPRO); manufacturers, recycling companies, sales companies and sector associations (ALBE); electricity distribution companies, customs and trade organizations; and customer organizations.

The Project will provide technical assistance to enhance processes and establish the required human and institutional capacities and skills. The Project will further co-invest in the replacement of a target volume of 42,000 household refrigerators and the simultaneous removal of obsolete equipment from the market. The approach of the Project is to establish appropriate conditions to guarantee the sustainability and effectiveness of the present governmental substitution programmes (aiming at short-term impact), and to contribute to a demand-driven market for EE appliances for the residential and public sectors (medium and long-term impact). This approach is fully consistent with achieving Objective CCM-2 under the GEF-5 focal area Climate Change (Promote market transformation for energy efficiency in industry and the building sector).

A.2. National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, etc.:

Energy efficiency and energy conservation are effective measures to reduce overall electricity consumption and peak loads demanded from the national electricity system. Energy efficiency is a strategic priority for the Government of Ecuador, as defined in the national development plan (*Plan Nacional del Buen Vivir, 2009-2013*), objective 4.3: “To diversify the national energy matrix, promote efficiency and increase the share of sustainable, renewable energies (...).” Objective 11.5 defines: “To increase coverage of basic infrastructure and public services (...) by strengthening the capacity to provide public services (including) electric energy (...) identifying co-financing mechanisms if required”. This

strategy builds forth on the findings in Ecuador's Second National Communication, which includes energy efficiency as one of Ecuador's voluntary national mitigation actions.⁵ The project also responds to the priorities of the Technology Needs Assessment, which, in its chapters on "Energy" and "Buildings" states the needs for improvements in energy efficiency and specifically addresses appliances as a target market segment⁶. More generally, the TNA consistently portrays the need for technical support and capacity strengthening to enhance national climate change mitigation and adaptation efforts. By providing support to the country's national energy efficiency programs the project responds directly to this request.

The Project is aligned with Government priorities and mandates under Art. 414 of the Constitution: "The State will adopt appropriate, transversal measures to mitigate climate change (...); and under Art. 15: "The State will promote the use of environmentally clean technologies and renewable, non-polluting, low-impact energies in the public and private sectors".

The Project responds to Presidential Decree 741 (21 April 2011)⁷, which establishes and defines the "Renova" program to substitute inefficient electricity-consuming appliances, and is being implemented by the MEER, MIPRO and the Ministry of Finance.

B. PROJECT OVERVIEW:

B.1. Describe the baseline project and the problem that it seeks to address:

Project Context

The modernization of the energy sector is a key priority in Ecuador's national development plans. Ecuador's Electricity Law⁸ aims at establishing framework conditions to deliver a high-quality, competitive and reliable electricity service as input for economic and social development. The *Plan Nacional del Buen Vivir*, issued by the National Secretary of Planning and Development (SENPLADES), highlights diversification of the national energy matrix, the promotion of energy efficiency and a greater share of renewable energy sources⁹.

The electricity sector was restructured in 1999, when former state-owned electricity monopolist INECEL was split up and transmission, generation and production sectors were separated. State-owned companies control most of the distribution sector, with the exception of Guayaquil, which is served by a municipal-owned distributor. A single, state-owned company, Transelectric, controls the transmission system. In 2010 the public company CELEP was created¹⁰, which holds the large hydro and thermal power generators¹¹ and the transmission company Transelectric and is now the single company responsible for power generation and transmission in the country. In April 2011, CONELEC¹² approved regulation to allow project development by the private sector and encourage the development of alternative energy sources, with the aim to increase electricity production in line with the Electrification Master Plan. While the installed generating capacity in Ecuador is sufficient to meet total demand, hydropower commonly

⁵ Segunda Comunicación Nacional de Ecuador a la CMNUCC, Chapter 3.1, Medidas Nacionales Voluntarias de Mitigación

⁶ Technology Needs Assessment - Prioridades Nacionales en Transferencia de Tecnología en Cambio Climático, Chapters 6.1.2, 6.1.5

⁷ The programme "Renovación de Equipos de Consumo Ineficiente", Presidential Decree No. 741, published in the Registro Oficial No.447, 13 May 2011.

⁸ Ley de Régimen del Sector Eléctrico, published 10 October 1996, Registro Oficial No.43.

⁹ Plan Nacional del Buen Vivir (2009-2013), Política 4.3.

¹⁰ Empresa Pública Estratégica Corporación Eléctrica del Ecuador CELEC EP (Decree 220, 14 January 14, 2010). Source: REEEP Policy Database (<http://www.reeep.org/>).

¹¹ The three hydro power generator Hidronación, Hidropaute, and Hidroagoyan, and three thermal generators, Termopichincha, Termoesmeraldas and Electroguayas.

¹² The regulatory entity Consejo Nacional de Electricidad (<http://www.conelec.gov.ec/>).

falls short in the dry season and additional power must be imported (from Colombia). For the medium-term, Ecuador has planned to build several new large hydroprojects.

Combining the large consumers and electricity distribution companies in Ecuador, total electricity consumption in 2011 was 17,748 GWh, which was 7.08% higher than in 2010. The average annual increase over the last 5 years was 4.9%. The highest peak demand in 2011 was 3,027 MW. The peak demand load showed an increase of 5.6%¹³. Net production in 2011 was 18,430 GWh from the following sources: hydropower 10,968 GWh (59.5%), thermal 6,044 GWh (32.8%)¹⁴, 147 GWh (0.8%) non-conventional sources and 1,270 GWh (6.9%) imports from Colombia. The share of hydropower has gradually declined over years as demand increase has been met by adding thermal capacity.

The total energy volume billed to the distribution companies was 14,077 GWh (2010), of which 36% is consumed by the residential sector (5,114 GWh), 31.4% by the industry (4,417 GWh), 19.0% by the commercial sector (2,672 GWh), 5.8% (812 GWh) by the public sector, and the remainder by other consumers.

Energy conservation and energy efficiency

There is large scope for energy conservation and energy efficiency (EE) in the residential sector. While lighting accounts for 49% of the sector's energy use, white good appliances and airconditioners add to nearly 46%. Peak shaving and demand reduction are highly rewarding for the Government, because: (a) the large majority of residential end-users belong to low-income families who access electricity at a subsidized tariff; and (b) in spite of being a net oil-exporter, fuels for thermal power plants must be imported at world market prices due to a lack of refinery capacity. Energy efficiency has therefore been a Government priority in Ecuador for more than a decade.

In the period 2002-2007, the Government received technical assistance under the World Bank/GEF PROMEC Project¹⁵. Already in 2004 the Government of Ecuador prepared a National Energy Efficiency Plan to implement a system of standards and labels (S&L) in the country. In 2007, the Ministry of Electricity and Renewable Energy (MEER) was created to coordinate and promote sector policies more effectively¹⁶. Among its first activities, MEER started a programme to develop mandatory EE standards under an Agreement with the national Standards Institute (INEN)¹⁷. This work was focused on the design of mandatory standards and test protocols for refrigerators, freezers and compact fluorescent lamps (CFLs). In close dialogue with manufacturers of household appliances and lighting equipment¹⁸, technical regulation (standard) RTE-035 was implemented in February 2009¹⁹. In June 2010, regulation RTE-036 came into force, defining the energy performance and verification criteria for compact fluorescent lamps²⁰. In November 2010, a modification to RTE-INEN 035 was issued, which stipulates that only class "A" refrigerators can be commercialized in Ecuador from 2 March 2011 onward²¹. It is further determined that standards and regulations be developed for washing machines and air conditioners (RTE 2495).

¹³ Boletín 2009 CONELEC.

¹⁴ Thermal sources are composed of kerosene (0.85%), natural gas (3.8%), fuel oil (13.4%), diesel (6.0%), and residues (9.5%).

¹⁵ Project IBRD/GEF 70820 "Power and Communications Sectors Modernization and Rural Services Project (PROMEC)", final evaluation 16 December 2008.

¹⁶ Decree No. 475, 23 July 2007, which split the former Ministry of Energy and Mining into a new Ministry of Non-Renewable Resources and a Ministry of Electricity and Renewable Energy (Ministerio de Electricidad y Energía Renovable - MEER).

¹⁷ Instituto Ecuatoriano de Normalización.

¹⁸ Including INDURAMA and OSRAM.

¹⁹ National technical regulation RTE INEN 035: "Eficiencia energética en artefactos de refrigeración de uso doméstico. Reporte de consumo de energía, métodos de prueba y etiquetado", published in the *Suplemento al Diario Oficial No. 524* (09 February 2009), which defines the procedures and conditions to determine the reference values (CER) and energy ranges for classifying the energy use of refrigerators, refrigerators with freezer compartment, and freezers; as well as the content of the required energy label. Source: www.inen.gob.ec.

²⁰ The technical regulation RTE INEN 036: "Eficiencia energética. Lámparas fluorescentes compactas. Rangos de desempeño energético y etiquetado", published 03 June 2010, which defines the minimum energy efficiency and the properties and content of product labels concerning the energy efficiency of compact fluorescent lamps (...). Source: www.inen.gob.ec.

²¹ Modificatoria 2 al Reglamento Técnico Ecuatoriano RTE INEN 035:2009, 26 November 2010.

In August 2009, the Commission of International Trade (COMEXI) issued resolution 505, which established full exemption of import duties for fluorescent lamps (CFLs, T5 and T8) that meet class “A” criteria under RTE INEN 036, and for refrigerators (compliant with RTE INEN 035). In December 2009, COMEXI resolution 529 dictated imports of incandescent lamps in the range 25-100W to be suspended from 01 January 2010 onward²².

In the field of policy development and institutional capacity, the Government receives support from the IDB/SECCI PAES project²³. The project finances consultancies to: (a) update information concerning electricity demand per economic sector; (b) design a plan to set specific energy saving targets for public lighting, small and medium enterprises, and for the commercial and residential sectors; (c) to identify EE opportunities in the electricity transmission and distribution system; and (d) to carry out energy audits in the indicated economic sectors. The Energy Plan for the residential, public and industrial sectors was concluded and presented in January 2012. Another project implemented by MEER is the UNIDO/GEF project EEI, which is aimed at the development of technical, institutional and normative capacities in the domestic industrial sector²⁴.

Lighting substitution programmes

Notwithstanding this important progress in terms of policy development and regulation, the Government recognizes that sector agents and customers face important barriers impeding them to adequately participate in the market transformation process. In order to generate short-term impact in terms of load demand reductions and cost savings, the Ministry of Electricity and Renewable Energy started the implementation of a lighting substitution programme in 2008, targeting the residential sector²⁵. The first phase of this programme (2008-2009) delivered 6 million CFLs to the lower-income strata of the population, while the second phase (2010-2011), distributed 10 million units to other residential users, to public sector entities, small businesses and workshops²⁶. Decree 1681 (2009)²⁷ urged central government entities to replace obsolete lighting systems by efficient ones and establish energy efficiency committees in each Department, technically assisted by the MEER. Subsequent Decree 238 (2010)²⁸ determines concrete time paths for the Departments to implement the required measures.

In October 2010 MEER and electricity company CNEL embarked on a substitution programme of about 65,000 street lights in the company’s concession area, with an investment budget of approx. USD 10 million (public budget)²⁹. The programme anticipates on the territory-wide introduction of energy-efficient public lighting, involving approx. 600,000 lighting systems and a public-private investment of USD 135 million.

Baseline project

²² COMEXI Resolution 505, 14 August 2009, published in Registro Oficial 33 (24 September 2009); the resolution entered into force on 1 March 2010.

²³ IDB Technical Cooperation EC-T1181 “Plan de Acción de Energía Sostenible para Ecuador – PAES”, implemented by MEER with a total budget of USD 1,610,000 and an IDB/SECCI grant of USD 1mln. The Project was signed in June 2009.

²⁴ The UNIDO/GEF project “Energy efficiency for the industry in Ecuador - EEP” with a GEF grant of USD 975,000. The project targets the implementation of energy management systems in the industry according to ISO 50001...

²⁵ Programme “Conversión Tecnológica en Iluminación Residencial”.

²⁶ In order to implement the Programme, MEER signed agreements with the electricity company of Guayaquil (*Corporación para la Administración Temporal Eléctrica de Guayaquil –CATEG*) and the local distribution companies (13 November 2008), and with the national electricity company CNEL (*Corporación Nacional de Electricidad*), on 07 March 2009. The first phase effectively distributed 5,682,000 CFLs, which delivered an estimated reduction in peak demand of 84 MW and corresponding electricity saving of 193.43 GWh per year. The first phase project was registered as a CDM project with the UNFCCC on 22 January 2011, allowing the issuance of certified carbon credits to an amount of 444,255 tons CO₂eq per year. Source: Ayuda Memoria MEER, May 2012.

²⁷ Decree 1681, 21 April 2009 (Registro Oficial 04 May 2009).

²⁸ Decree 238, 28 January 2010.

²⁹ *Convenio Específico de Cooperación MEER - Corporación Nacional de Electricidad (CNEL)*, 20 October 2010. The programme envisages the substitution of 64,655 mercury lamps by high-pressure sodium over a 12-months period. Besides being economically attractive, the programme will expectedly yield annual energy savings of the order of 26.4 GWh.

On 12 April 2011, the *Renova* programme³⁰ was created by Presidential Decree 741 to accelerate the introduction of energy-efficient, class “A” refrigerators under residential end-users and simultaneously removes old equipment from the market. The programme establishes a financial incentive (“*bono*”) for the end-users, which is complemented by a credit facility to finance the acquisition of a new appliance for the customer. The *Renova* Programme has been approved by the National Assembly and is presently under preparation. The Programme involves agreements between the ministries MEER, MIPRO and MCPEC, MF, MAE, MIDUVI³¹ and the national development bank BNF; as well as between MEER and MIPRO, the national manufacturers of refrigerators INDUGLOB and ECASA, and the sector organization ALBE.

Besides acting upon the end-users, the programme collaborates with the industry to supply the market with sufficient quantities of eligible, energy-efficient refrigerators, hence promoting technological innovation by the national manufacturing industry³². The programme aims to replace 330,000 refrigerators over a 5-year period. The financial incentives are targeted at the lower-income population with annual energy consumption below 200 kWh/month³³. Expectedly 10% of the units will be purchased in cash, and BNF will issue 300,000 short-term loans at an interest rate of 5%. The estimated reduction in demand load is 20.6 MW; the annual energy savings are 215.8 GWh and the associated greenhouse gas emission reduction from the national power sector of the order of 122,000 tons CO₂eq per year. The total investments add to USD 177.5 million³⁴.

Presently MEER is studying an addition to the *Renova* programme to promote the substitution of inefficient air conditioners in the residential sector. This plan would encompass the replacement of 150,000 appliances in 4 years, with an estimated budget of USD 36 million. Since air conditioners are predominantly used by the wealthier social strata, financial incentives will include a price subsidy but no dedicated credit scheme. Different to refrigerators, there is no significant national manufacturing capacity for air conditioners and by consequence the programme would be focused on imported products. The expected energy savings would be of the order of 130 GWh per year, with a demand peak reduction of about 50 MW³⁵.

The *Renova* program is an ambitious, first-time experience for Ecuador. While it is coordinated by the MEER, its successful implementation requires the intervention of numerous stakeholders, as described above. Due to the country’s limited experience in managing this type of program, the initiation phase of the program has been delayed, with the initial disbursements only occurring in the second semester of 2012. As the program relies on annual budgetary contributions from the central government, such delays are challenging, as they may possibly compromise future allocations. However, the project budget for 2013, which consists of the main co-financing source for the GEF project, is secured.

³⁰ The “*Programa para la Renovación de Equipos de Consumo Energético Ineficiente*”.

³¹ The Ministries MEER: Electricity and Renewable Energy; MIPRO: Industry and Productivity, MCPEC: Coordinating Ministry of Production, Labour and Competitiveness. MF: Finance; MAE: Environment; MIDUVI: Urban Development and Housing.

³² Project document “*Programa para la Renovación de Equipos de Consumo Energético Ineficiente: Proyecto No.1 Sustitución de Refrigeradoras*”, MEER October 2011.

³³ This is actually about 80% (4 quintiles) of the total population of Ecuador (about 15 million people). There is a clear correlation between energy consumption and income level, the poorest quintile consuming an average 61 kWh/month and the highest quintile 221 kWh/month. A price subsidy (“*bono*”) is reserved for lower-income households. The penetration rates per social stratum are based on socio-economic data from the 1995 census (INEC and World Bank); more recent data are not available.

³⁴ The total price (including delivery, recycling of the old equipment and management by the electricity distribution companies) is USD 537.80, of which USD 482 the price paid to the manufacturer. The State will pay a subsidy of USD 250 to low-income families and USD 200 to other, eligible beneficiaries; and absorb the recycling costs (USD 17 per unit). The total investment for the State is USD 81.5 million; the remainder (USD 96.0) is paid by the end-users, either directly or through a credit facility charging a 5% interest rate.

³⁵ Source: Ayuda memoria May 2012, MEER.

The start-up phase of Renova has demonstrated that, despite the motivation and good will of the government to promote energy efficiency, executing a program of this kind requires significant technical know-how and managerial expertise, as well as a strong institutional framework which is currently not in place. Furthermore, there are important areas where the program can be strengthened to ensure that it meets the expected results. An appliance retirement component is envisioned, yet the removal and recycling and/or destruction of CFCs needs to be fully incorporated to ensure that potent GHGs are not released during this stage. Furthermore, the testing and verification of the new equipment to be installed needs to be perfected, as the current laboratory installations are insufficient and the existing technical capacity is limited. While the Renova program is a strong expression of the government's intent to promote energy efficiency, the initial period of operation has demonstrated that it requires technical support for its implementation. This offers a unique opportunity for the GEF, as supporting this initiative can significantly improve the program implementation, thus ensuring its continuity and, more importantly, catalysing a sustainable and longer reaching market transformation in Ecuador.

In this context, the base project considered for the proposed GEF Project consists of the initial phase (one year) of the full Renova Programme, with an envisaged delivery of 42,000 EE refrigerators to end-users (worth US\$ 22,587,600). The GEF intervention is aimed to strengthen the first phase of the Renova program, ensuring that it has the capacity to meet its established objectives and exploits all opportunities to reduce GHG emissions, by promoting energy efficiency, removing obsolete equipment, and avoiding the release of CFCs. The combined GEF/Renova program will test delivery models and address sustainability issues before up-scaling. Furthermore, the GEF involvement aims for a longer term market transformation, and will focus on creating market interest for EE appliances from those end-user groups that are not directly addressed by governmental substitution programmes. The identified barriers for the implementation of Renova are described in the next paragraph.

Identified barriers

Market barriers: The Government of Ecuador presently introduces EE technologies in the country by implementing substitution programmes of lighting and household appliances, but acknowledges that this model is limited in terms of market penetration, flexibility and availability of public resources³⁶. Eventually, market actors need to take over and create a demand for EE technologies. This requires sector agents, specifically end-users and suppliers, to become aware of the opportunities and benefits of EE technologies and be able to communicate about these. EE standards and labeling play an important role in this process as far as household appliances are concerned. With respect to the public sector, it involves the integration of EE requirements in bidding procedures for goods and services.

Technical and institutional barriers: It is also recognized that the institutional framework for the implementation and enforcement of EE standards in Ecuador needs to be strengthened, which involves a variety of stakeholders. The current institutional framework is fragmented, with the MEER as a lead coordinator of EE activities but without the experience or mandate to ensure the appropriate participation of the numerous institutions involved in the initiative. Without such a framework, the country's capacity to verify compliance of appliances with national EE standards will be inadequate. National test laboratories play a central role in the verification process but are barely prepared for this task. Sector agents, importers and distributors, and customs officers need to become acquainted with EE regulation and labeling and trained in the application thereof. With respect to the substitution process of refrigerators, freezers and air conditioners, there is a need for strengthening the recycling process of obsolete equipment. Presently there are only few certified recycling companies in Ecuador, which limits the national capacity to effectively disassemble obsolete refrigerators in an environmentally responsible manner, specifically as it concerns the capture of banned refrigerants.

³⁶ As a result of fiscal budget constraints, the substitution programme for air conditioners, under preparation by MEER, has not yet been approved by the National Assembly.

Policy and information barriers: While progress has been made in terms of banning inefficient devices³⁷, end-users may not be in a position or unwilling to purchase more expensive appliances meeting the new EE standards. This may lead to the prolonged use of old equipment, the surge of second-hand markets, and parallel imports. Additional measures to support market introduction include: financial incentives for users not targeted by governmental substitution programmes; enforcement of technical regulation (standards and labels); establishment of partnerships with importers and retailers; promotional campaigns to create awareness about social and environmental benefits and the concept of life-cycle costs. This kind of market barriers is presently not addressed by the Government.

B. 2. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund/NPIF) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

The objective of the proposed UNDP/GEF Project “*Securing energy efficiency in the Ecuadorian residential and public sectors (SECURE)*” is to increase the share of energy-efficient electric appliances in the residential and public sectors. This will contribute to the reduction of greenhouse gas emissions by the national electricity sector.

The project will complement and enhance the baseline project activities by co-investment and by providing technical assistance to key sector stakeholders. The project focuses on two main aspects; (a) strengthening and supporting the governmental substitution programmes, whose success is essential to ensure the sustained government support for energy efficiency programmes, and (b) creating the conditions for sustainability by removing policy, institutional, market, technical and information barriers. The GEF intervention will significantly strengthen the implementation of the Renova program, whose inception phase has demonstrated the need for technical support in order to deliver its ambitious objectives. With GEF support, the program will increase its capacity to implement annual refrigerator substitution targets, ensure the adequate removal of obsolete equipment and the destruction and/or recycling of GHG CFCs, and expand to additional appliances, including an air conditioner replacement program. Furthermore, while the government substitution programmes are primarily focused on short term impact, the GEF program will generate conditions promoting energy efficiency in the long run, strengthening the institutional and policy framework, as well as increasing technical capacity and consumer awareness, to increase the market penetration of energy efficient appliances.

The Project is composed of the following components:

1. Establishment of a conducive governance framework that promotes the adoption of EE appliances by the residential and public sectors;
2. Enhancement of national technical capacities to effectively implement, apply, and enforce EE standards for household appliances entering the market.
3. Removal of a target volume of EE household appliances (refrigerators) to catalyze the phase-out and replacement of obsolete and energy inefficient household appliances.

The total project budget is estimated at US\$ 25,627,600. for which a grant US\$ 2,000,000 is requested from the GEF (this inclusive of GEF Agency fees and PPG). Co-financing resources amounting to US\$ 23,587,600 are provided by the Government of Ecuador (US\$ 9,660,000 cash grant and US\$ 12,927,600 cash soft loan under the refrigerator substitution programme); and the Ministry of Electricity and Renewable Energy (US\$ 1,000,000 in-kind). UNDP has committed US\$ 40,000 in cash TRAC funding to support awareness raising and promotional activities.

The components of the Project are briefly described below:

³⁷ Specifically INEN RTE-035, RTE-036, and COMEXI resolutions 509 and 526.

Component 1: Governance and Legal Framework on the Use of Energy Efficient Appliances (GEF: US\$ 200,000; cofinance: US\$ 425,000). This component encompasses the preparation and approval of amendments to the legal and regulatory framework (laws, by-laws and resolutions) to promote the introduction of EE appliances and enforce the phasing out of obsolete and energy inefficient equipment in the public and residential sectors. It further contributes to the design and implementation of a financial incentive mechanism, possibly aligned with, or integrated into, existing credit instruments targeting this group of end-users³⁸. With respect to the public sector, the Project pursues full integration of the highest energy standards into the procurement system for public goods and services (SNCP). It further aims at obtaining detailed knowledge in terms of product classes and types available on the market; domestic manufacturing volumes; imported volumes per product class and type; import channels; existing customs mechanisms; and the roles of import agents, intermediaries and sales agents. It will also assess the size and relevance of the market for second-hand equipment in the country. Specialized technical assistance will be hired to identify critical issues and to draw up detailed recommendations to enhance the effectiveness of a national S&L system for household appliances. The activities under this component will be coordinated with the IDB PAES initiative, which is also implemented by MEER. The expected outcome from this component is the approval and implementation of a conducive governance framework that increases the use EE appliances by the residential and public sectors.

Component 2: Enhancement of Technical Capacities on Energy Efficiency Standards Enforcement (GEF: US\$ 650,000; cofinance: US\$ 175,000). This project component aims at strengthening and consolidating the national infrastructure to prepare and implement energy performance standards for electric appliances, including the technical capacities for product testing and verification. Given the lack of adequate facilities and equipment, GEF resources will be used to enable national accredited test laboratories to effectively execute energy performance tests on household appliances. The envisaged outputs include training of technical staff from laboratories, manufacturers, sales companies and electricity companies, and other relevant professionals from the sector. It will further contribute to the preparation of technical regulation for air conditioners and washing machines (energy performance standard RTE 2495) and the implementation thereof. For air conditioners and refrigeration standards, coordination will be sought with the Montreal Protocol to harmonize the HCFC phase out plan (currently under implementation) and ensure the introduction of refrigerants with low GWP. This component will further review and enhance the technical guidelines and procedures for critical actors, including test laboratories, recycling companies, electricity distribution companies, and suppliers. A systemic approach will be followed to identify opportunities to increase overall efficiency and quality throughout the delivery process. The expected outcome from this component is that new household appliances entering the Ecuadorian market meet established energy efficiency performance standards.

Component 3: Energy Efficient Household Appliances Utilization (GEF: US\$ 838,000; cofinance: US\$ 22,777,600). This Project component comprises the purchase of EE equipment by the residential sector. Envisagedly, the Project will accompany the procurement of approx. 42,000 EE refrigerators by low-income households under a substitution programme presently under preparation by MEER. The investment capital for the appliances will be provided by the national Government (a subsidy of USD 230 per unit), the remainder (USD 307.80) being paid by the end-user under a credit facility. The Project team and UNDP CO will support MEER by: (i) strengthening MEER's coordinating capacity; (ii) providing resources to address logistical issues, in particular the removal of old equipment from the market; (iii) promoting inter-institutional coordination; and (iv) monitoring of the overall process, and collecting lessons-learned. The Project will provide investment capital to increase the processing capacity of recycling companies and ensure the effective removal of obsolete equipment from the market, including the recycling and/or destruction of GHG refrigerants. During the PPG phase, synergies will be explored with activities in Ecuador under the Protocol of Montreal. This component will further implement a promotional campaign targeting the residential sector, in coordination with sector associations (ALBE),

³⁸ GEF support to this activity will be complementary to the IDB PAES project.

manufacturers, sales companies and electricity distribution companies. The expected outcome from this component is that obsolete and energy inefficient household appliances are phased out and replaced with energy efficient units entering the market.

Global GHG benefits

The Project pursues direct GHG benefits through the planned substitution programme for refrigerators, equivalent to the replacement of 42,000 units. The annual energy savings are of the order of 12,600 MWh, with a corresponding reduction in GHG emissions by the national electricity sector of 3.28 kton CO₂eq/yr³⁹. Over a 10-year life time of the investments, and applying a 60% GEF-causality factor, the total direct GHG benefits are estimated at 20 ktons. The project will also establish the conditions for continuity of the substitution program, which will result in further removal of refrigerators and its expansion to other appliances (starting with air conditioners). Based on the replacement potential of refrigerators as a proxy for household appliances (refrigerators, freezers, airconditioners), the indirect benefits as a result of market transformation are estimated to be of the order of 500 kton CO₂eq over the Project's time horizon⁴⁰. As an indicative figure, the cost-effectiveness for the proposed initiative will be of the order of 4.0 USD/ton CO₂eq avoided. Furthermore, the recycling and/or destruction of refrigerants is a key component of the project that will prevent substantial emissions of CFCs, which are gases with very high GWP. A detailed assessment of the expected GHG benefits will be prepared at PPG stage.

B.3. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF). As a background information, read Mainstreaming Gender at the GEF."

At the national level, the Project, will contribute to energy sector efficiency, indirectly fostering economic productivity and competitiveness. By reducing electricity demand from the lower social strata, the Government saves valuable foreign currency resources since tariffs for this group are subsidized and refined fossil fuels for thermal power generation are bought at (high) international market prices. Additional economic benefits derive from postponing investment decisions in power generation⁴¹. From an economic perspective, the substitution projects are highly attractive for the Government⁴².

The Project contributes to the creation of social and economic capital in the electricity sector by promoting system efficiency (from generator to end-user), reducing transmission and distribution losses, and increasing know-how to implement EE measures at end-user's premises. The Project also strengthens the capacity of (and coordination between) stakeholders, including manufacturers, sales companies, branch and customer organizations, government authorities and regulatory bodies including MEER, MIPRO, COMEXI and INEN, to increase the value-added per energy unit by the national economy.

³⁹ At an estimated CO₂-intensity of the electricity sector of 0.26 tons CO₂eq/MWh.

⁴⁰ Presently, more data is available for refrigerators than for other appliances, such as air conditioners and washing machines. The total number of households connected to the grid is 3.1 million (source: Renova project document, p.8). At a penetration rate of 90%, the total number of refrigerators is around 2.8 million. Assuming an average energy saving of 300 kWh per unit per year (including baseline shift effects), total annual savings amount to 840,000 MWh. If annually 10% of the refrigerators is replaced (effective lifetime estimated at 10 years), the total operating time would be 55%. In 10 year, this yields a total energy savings of 4,620,000 MWh over the Project's 10-year impact horizon. The associated GHG benefits are 1,200 ktons CO₂eq. By applying a GEF causality factor of 40%, the total indirect GHG benefits are estimated of the order of 500 ktons CO₂eq.

⁴¹ At the supply side, these benefits may be limited to the short-medium term future as Ecuador is planning to substantially increase the share of hydropower in the national electricity generating mix.

⁴² The internal rate of return for the refrigerator substitution project (budget USD 177 M) is 17.4%. Source: Project profile "Programa para la Renovación de Equipos de Consumo Energético Ineficiente: Proyecto No.1 Sustitución de Refrigeradoras", MEER, October 2011, p.32.

At the level of end-users, the introduction of EE equipment implies a significant cost reduction. Although available socioeconomic data are outdated⁴³, refrigerators account for 25-30% of residential energy use. The use of more efficient refrigerators would yield cost savings of the order of USD 50,- per year for an average family⁴⁴. The benefits for CFL substitution are smaller but cost recovery is usually quicker (1-3 years). For low-income families, these savings translate into a significant improvement of the household budget. The substitution programme for air conditioners (presently under preparation but not yet approved by the Government) will target a more wealthy stratum of society. The impact of monetary benefits derived from energy savings are presumably less relevant for this group.

Gender issues have not been identified at PIF stage. The introduction of more efficient and more modern appliances potentially brings along greater comfort for their users, who are predominantly women (in the case of refrigerators and washing machines). Gender issues will expectedly vary according to social stratum. It is proposed to identify and analyze gender aspects in more detail during the preparation phase of this initiative.

B.4 Indicate risks, including climate change risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the project design:

Risks	Likelihood	Remedial actions
1. The Government would no longer prioritize energy efficiency.	Low	The SECURE initiative has been proposed in response to national policy and builds forth on extensive public investment programs to introduce EE appliances in the residential and public sectors. The project is embedded in a context of close collaboration with national counterparts and multilateral agencies (including UNDP, UNIDO, IDB) and there are no foreseeable changes in this situation that would adversely affect the implementation of the Project. By consequence, the likelihood of this risk has been assessed as very low; no mitigation actions are proposed.
2. The technical and institutional infrastructure in Ecuador would impede the effective application and enforcement of EE standards and labels for household appliances.	Medium	This risk would potentially translate into a deficient or partial application of more stringent energy standards (class “A”) to household appliances on the market. Several causes exist: (i) lack of capacity to verify and label new products that come on the market; (ii) incapacity to control second-hand markets and removal of obsolete equipment; (iii) lack of effective customs control; (iv) lack of capacity of domestic manufacturers to supply to Government-led substitution programmes; and (v) lack of transparency and supervision of product verification procedures. The SECURE project is designed to address eventual flaws in the national S&L system, propose corrective measures and build capacities with the aim to maximize impacts.
3. MEER would prove unable to successfully implement the Project	Low	This risk would directly affect the effectiveness and efficiency of the project. Given MEER’s large experience managing and coordinating complex public- and donor-funded programmes, this risk is deemed very low. The Project Manager, on behalf of MEER, will be in charge of periodic reporting, including progress reporting and self-assessments, under guidance of UNDP CO and RTA.
4. Investments in EE equipment would not materialize due to a lack of co-funding sources.	Low	This risk would negatively affect the volume of EE appliances to be installed under the Project and prevent global GHG benefits from taking place (impact risk). Given the fact that cofinanciers must confirm commitment upon Project approval, and the high priority given to EE by the Government, it is highly unlikely that the co-funding substitution programs would be stalled. If this would happen then short term impacts would be largely reduced. However, the Project can still achieve substantial, measurable, impact by stimulating residential users to purchase EE equipment (long-term impact by market transformation).
5. Public sector and residential customers	Medium	This risk would adversely affect the magnitude and sustainability of long-term impacts. The Project includes mitigating actions by: (a) advocating the

⁴³ Actualized data will become available under the IDB PAES initiative.

⁴⁴ The average energy consumption of refrigerators commercialized until 2007 was 745 kWh/yr (class “E”-“G”). A class “A” unit would consume a maximum of 360 kWh per year (29.8 kWh/month for a 10-foot refrigerator), about 400 kWh saving per year. At an indicative tariff of USD 0.08, this represents a saving of approx. USD 50,000 per year.

would prove reluctant to choose energy efficient equipment after termination of Government-led substitution programmes.		integration of EE criteria in the public acquisition system (SNCP); (b) create awareness about the benefits of EE appliances among the general public; (c) establish financial incentives to make EE purchases more attractive to residential end-users; and (d) support the continuation of EE standards development under leadership of MEER and INEN.
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B.5 Identify key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable:

The stakeholders of the SECURE initiative include:

- Ministry of Electricity and Renewable Energy (MEER), and the Subsecretariat for Renewable Energy and Energy Efficiency. MEER is the leading government entity responsible for energy efficiency and coordinates and implements government and donor-initiated programmes. MEER will be the executing agency for the SECURE project.
- Ministry of Industry and Productivity (MIPRO), and the Subsecretariat of Quality. MIPRO is responsible for coordinating equipment substitution programmes with the national industry and with MEER. MIPRO is further responsible for the enforcement of Technical Regulations in Ecuador.
- Ministry of Environment (MAE), which is responsible for climate change policy in Ecuador, including the monitoring and verification of achieved greenhouse gas reductions under UNFCCC-approved mechanisms.
- National Development Bank (BNF), which is responsible for the disbursement of payments to equipment manufacturers and for collecting loans issued to end-users. BNF acts as the financing agent for the loan part of the Renova programme.
- Committee for International Trade (COMEXI), which is responsible for issuing regulation affecting the import of appliances. COMEXI will be involved in the policy development activities of the SECURE program.
- Ecuatorian Accreditation Entity (OAE), which supervises the system of national accredited laboratories in Ecuador. OAE involvement includes the design and adoption of additional criteria for the accreditation of laboratories to perform EE test on household appliances and to expend compliance certificates.
- Ecuatorian Normalization Institute (INEN), which is responsible for preparing technical regulations (standards). The SECURE initiative will continue the development process of national EE standards in Ecuador, for which INEN is a critical counterpart.
- National Customs Service, which controls imports and exports of good across the national borders and applies duties when applicable. The Service plays an important role in the enforcement of EE standards on imported appliances, to ensure proper product labeling and prevent illegal imports. SECURE will strengthen the Service’s capabilities and knowledge in this field.
- Electricity distribution companies. The electricity distribution companies act as the delivery channel for the Government-led substitution programmes for refrigerators, CFLs and air conditioners.
- Recycling companies are the environmental agents in charge of the recovery of the obsolete appliances from the beneficiaries of the Renova program. These companies, which presently lack capacity, will be addressed by the SECURE Project to perform adequately and ensure the environmentally responsible removal of refrigerators from the market.
- The sector association (ALBE) advocates the interest of private manufacturing and sales companies of white good in Ecuador. Policies to promote the adoption of EE appliances by the residential and public sector need to benefit from the sector’s capacity as an intermediary with the end-users.

- National manufacturers of white good appliances, including INDUGLOB and ECASA, are direct partners of the Government of Ecuador in the Renova Project. Although not addressed specifically by SECURE, professionals from the industry are expected to benefit from technical assistance activities.

The role of civil society organizations and indigeneous communities has not been investigated during PIF stage. Important lessons-learnt can likely be retrieved from the CFL and refrigerator substitution programmes, including possible gender issues. Relevant information will be analyzed during the PPG phase and used as input for final project design.

B.6. Outline the coordination with other related initiatives:

The present UNDP/GEF SECURE initiative has been designed to enhance other EE programmes under execution by the Ministry of Electricity and Renewable Energies, including (i) the national substitution programmes for household refrigerators and public lighting; (ii) the national substitution programme for airconditioners (in preparation); (iii) the PAES programme implemented by IDB; and (iv) the UNIDO/GEF EEI programme, which targets energy management in the industrial sector. Programmes (i) and (ii) are baseline activities for the UNDP/GEF initiative, and are primarily focused on investment in equipment and the actual delivery of appliances to the end-users. The GEF project will provide co-investment and technical assistance to increase the effectiveness and sustainability of the national substitution programmes.

Significant synergies exist with the components I (energy efficiency) and III (institution building and promotion) of the IDB PAES initiative. While PAES will characterize the electricity demand in the residential, public, commercial and industrial sectors in terms of energy uses⁴⁵, the GEF project will focus on the technical performance of appliances and on the sales and distribution mechanisms to serve the residential user's market. PAES will also make a start identifying options for financial incentives for EE technologies; the GEF project will build upon these results. No direct synergies have been identified with the UNIDO/GEF EEI programme, as it operates in a different sector (industry) than the UNDP/GEF SECURE initiative (residential and public).

At the interministerial level, MEER will closely coordinate the initiative with other Ministries, specifically MIPRO and MAE.

C. DESCRIBE THE GEF AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

C.1 Indicate the co-financing amount the GEF agency is bringing to the project:

UNDP has committed cash support to an amount of US\$ 50,000 to support awareness raising and capacity building activities in the field of energy efficiency and climate change mitigation. This corresponds to 8% of UNDP's annual budgetary allocation to Ecuador. Additional resources will be sought during the project preparation phase and will be presented at the time of CEO endorsement. The UNDP Country Office further provides in-kind and cash support during the project preparation phase.

C.2 How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:

The presented UNDP/GEF Project is aligned with UNDAF Outcome: "*Promotion of the formulation and implementation of policies to mitigate GHG emissions and other pollutants, to promote electricity generation from renewable sources, energy efficiency and access to reliable energy services*". The National Development Plan and other energy planning tools have specific targets on the introduction of

⁴⁵ For example: lighting, cooling, heating, mechanical power, transport, and others.


less carbon-intensive technologies and practices. The UNDP Country Office in Ecuador has permanent staff with expertise in energy & climate change, and has successfully implemented GEF CC projects in the country. The UNDP Regional Coordination Unit (RCU) for Latin America and the Caribbean (based in Panama) provides technical technical backstopping as well as support during project implementation and monitoring. The RCU counts with highly experienced staff in the field of climate change and energy programmes, and counts with a pool of associated experts.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. Record of Endorsement of GEF Operational Focal Point (S) on Behalf of the Government(s):

NAME	POSITION	MINISTRY	DATE (Month, day, year)
MARCELA AGUIÑAGA VALLEJO	MINISTER	MINISTRY OF ENVIRONMENT	AUGUST 27, 2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.					
Agency Coordinator, Agency name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Adriana Dinu UNDP/ GEF Officer-in-Charge		January 17, 2013	Oliver Page Regional Technical Advisor EITT	(507) 302 4548	OLIVER.PAGE@UNDP.ORG