

NS-314 - NAMA of the Hydropower development in Ecuador NAMA-DCH (for its acronym in Spanish)

Ecuador

NAMA Seeking Support for Implementation

A Overview		
A.1 Party	Ecuador	
A.2 Title of Mitigation Action	NAMA of the Hydropower development in Ecuador NAMA-DCH (for its acronym in Spanish)	
A.3 Description of mitigation action	The NAMA DCH will contribute to climate change mitigation by displacing thermal generation in the National Interconnected System (SINTE) through hydropower development, including projects both currently functioning and those planned in the Master Plan of Electrification (PME, for its acronym in Spanish) which is developed annually with a 10 years horizon. The NAMA DCH considers the construction and operation of eight prioritized projects until 2017 which amount a total installed capacity of 2,832 MW. In addition, the implementation of other hydroelectric and non-conventional renewable energy power plants (wind, solar, geothermal) considered in the PME, represent nearly 3,604 MW of installed capacity. Regarding the emission reductions calculation, the Software "Long-range Energy Alternatives Planning System" (LEAP) was used. The estimated greenhouse gas reduction is as high as 85,6 million tons of CO₂ equivalent (MtCO₂eq), during 2016-2025. Through the NAMA DCH, the share of renewable electricity generation in Ecuador will increase from 43% to 90% in 2025.	
A.4 Sector	☒ Energy supply ☐ Residential and Commercial buildings ☐ Agriculture ☐ Waste management ☐ Other	
A.5 Technology	☐ Bioenergy ☐ Energy Efficiency ☒ Hydropower ☒ Wind energy ☐ Carbon Capture and Storage ☐ Land fill gas collection ☐ Other	
A.6 Type of action	☒ National/ Sectoral goal ☒ Strategy ☒ National/Sectoral policy or program ☐ Other	
A.7 Greenhouse gases covered by the action	☒ CO ₂ ☐ N ₂ O ☐ PFCs ☐ Other	
B National Implementing Entity		
B.1.0	Name	Ministry of Electricity and Renewable Energy (MEER)
B.1.1	Contact Person 1	María Fernanda Jara
B.1.2	Address	E10-25 José Tamayo St., Quito
B.1.3	Phone	+593-2 397-6000, ext. 1246
B.1.4	Email	fernanda.jara@meer.gob.ec
B.1.5	Contact Person 2	Adrián Moreno
B.1.6	Address	E10-25 José Tamayo St., Quito
B.1.7	Phone	+593-2 397-6000, ext. 1544
B.1.8	Email	adrian.moreno@meer.gob.ec
B.1.9	Contact Person 3	
B.1.10	Address	
B.1.11	Phone	

B.1.12	Email	
B.1.13	Comments	
B.2.0	Name	Ministry of Environment of Ecuador (MAE)
B.2.1	Contact Person 1	Maria Victoria Chiriboga
B.2.2	Address	1159 Madrid St., Quito
B.2.3	Phone	+593-2 398-7600 ext. 1303
B.2.4	Email	maria.chiriboga@ambiente.gob.ec
B.2.5	Contact Person 2	Freddy Fuertes
B.2.6	Address	1159 Madrid St., Quito
B.2.7	Phone	+593-2 398-7600 ext. 1308
B.2.8	Email	freddy.fuertes@ambiente.gob.ec
B.2.9	Contact Person 3	
B.2.10	Address	
B.2.11	Phone	
B.2.12	Email	

[Add Additional Entity](#)

C Expected timeframe for the implementation of the mitigation action

C.1	Number of years for completion	10
C.2	Expected start year of implementation	2016

D Currency

D.1	Used Currency	USD
Conversion to USD: 1		

E Cost

E.1.1	Estimated full cost of implementation	11,718,000
Conversion to USD: 11,718,000		
E.1.2	Comments on full cost of implementation	In accordance with PME 2013-2022, the renewable energy generation expansion budget is 6,043.57 million dollars. The NAMA D the construction and operation of other hydroelectric power stations such as Paute Cardenillo and Santiago G8 (currently no final resources support) with a cost of 1,135 and 3,500 million dollars respectively.
E.2.1	Estimated incremental cost of implementation	4,687,000
Conversion to USD: 4,687,000		
E.2.2	Comments on estimated incremental cost of implementation	

F Support required for the implementation the mitigation action

F.1.1	Amount of Financial support	4,687,000
Conversion to USD: 4,687,000		
F.1.2	Type of required Financial support	☒ Grant ☐ Guarantee ☒ Loan (sovereign) ☒ Equity ☐ Loan (Private) ☒ Carbon finance ☒ Concessional loan ☐ Other
F.1.3	Comments on Financial support	The NAMA DCH is open to several solutions regarding the financing of the hydropower projects as indicated in F.1.2. This amount an Integrated watershed management plan, a Coordination Unit, a MRV System, and the construction of the Cardenillo and Santiago hydroelectric plants. The Coordination Unit will be the entity responsible for carrying out the MRV System reports and the NAMA implementation process. Additionally it will be responsible for calculating the mission factor of the National Grid. 1. Capacity building F.3.1 (Integrated watershed management plan) : 50 MUSD 2. Coordination Unit and MRV System: 2 MUSD 3. Construction of the Paute Cardenillo hydroelectric power station: 1,135 MUSD 4. Construction of the Santiago G8 hydroelectric power stations: 3,500 MUSD Capacity building support: 2 MUSD
F.2.1	Amount of Technological support	
F.2.2	Comments on Technological support	The amount of technological support is include in F.1.3
F.3.1	Amount of capacity building support	50,000,000
Conversion to USD: 50,000,000		

F.3.2 Type of required capacity building support	☐ Individual level ☒ Institutional level ☒ Systemic level ☐ Other
F.3.3 Comments on Capacity Building support	The strengthening of capacities and territorial planning related to the climate, as well as the management of knowledge through training and sensitization, are very important stages for the implementation of an integrated watershed management plan. The amount requested specifically for the development of specific strategies on matters related to: intervention and conservation of moors, agro-silvopastoral systems, forest preservation and restoration, implement sustainable practices for prevention and control of erosion. The quality and quantity of water available for hydroelectric generation depends mainly on watershed management practices, from highlands to lowland areas. For this reason, it should be considered an Integrated watershed management plan for PME hydroelectric projects. In accordance with the project "Analysis of the vulnerability of emblematic hydroelectric plants", the implementation of a set of measures will cost 5 million dollars approximately, in a short term (5 years) per hydroelectric plant (8 emblematic, Cardenillo and 3 hydropower plants).

G Estimated emission reductions

G.1 Amount	8.5
G.2 Unit	MtCO ₂ e/yr
G.3 Additional information (e.g. if available, information on the methodological approach followed)	Each scenario analysis and the specific considerations considered in the energy sector are developed using the Long-range Energy Alternatives Planning Systems (LEAP) program. The Business as Usual (BAU) scenario was built according to the trend projection of emissions growth based on information from the Energy Balance (BEN, for its acronym in Spanish) during 2011 to 2015 period. The mitigation scenario includes the whole operation of all hydroelectric generation planned to 2025.

H Other indicators

H.1 Other indicators of implementation	There is currently a Technical Commission for the Decomposition of Greenhouse Gas Emission Factors, which is responsible for calculating and updating the CO₂ Emission Factor of the National Interconnected System of Ecuador. It was formed in 2010 where the Ministry of Environment, Ministry of Electricity and Renewable Energy, the Electricity Regulation and Control Agency and the National Electric Company take part. Emission factors have been published up to 2013. We are currently updating the calculations of the emission factor, according to new hydroelectric power plants connected to the national grid.
--	---

I Other relevant information

I.1 Other relevant information including co-benefits for local sustainable development	The components listed in section F.1.3 are related to the following co-benefits: - Reduction of fossil fuels for power generation. - Reduction of government spending on fossil fuels subsidies. - Use of low-impact alternative energies. - Direct and indirect employment generation in the phases of construction, operation, maintenance and complementary service.
--	---

J Relevant National Policies strategies, plans and programmes and/or other mitigation action

J.1 Relevant National Policies	- National Plan for Good Living 2013-2017. - National Climate Change Strategy 2012-2025 - Master Plan of Electrification 2013-2022 - National Energy Agenda 2016-2040
J.2 Link to other NAMAs	(none)

K Attachments

K Attachments	<table border="1"> <thead> <tr> <th>Title</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td colspan="2">No records to display.</td> </tr> </tbody> </table>	Title	Description	No records to display.	
Title	Description				
No records to display.					
K.1 Attachment description					
K.2 File	Choose File No file chosen				

L Support received

L.1 Outside the Registry											
L.2 Within the Registry	<table border="1"> <thead> <tr> <th>Support provided</th> <th>SupportType</th> <th>Amount</th> <th>Comment</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td colspan="5">No records to display.</td> </tr> </tbody> </table>	Support provided	SupportType	Amount	Comment	Date	No records to display.				
Support provided	SupportType	Amount	Comment	Date							
No records to display.											