

NS-83 - NAMA for accelerated geothermal electricity development in Kenya

Kenya

NAMA Seeking Support for Implementation

A Overview

A.1 Party

Kenya

A.2 Title of Mitigation Action

NAMA for accelerated geothermal electricity development in Kenya

A.3 Description of mitigation action

Kenya launched its National Climate Change Action Plan (NCCAP) in 2013, in which accelerated geothermal power development was identified as a mitigation option that has large greenhouse gas (GHG) emissions reduction potential and highly positive co-benefits.

Kenya's short-term ambitions for geothermal are outlined in the 5,000+ MW in 40 months initiative launched by the Government of Kenya (GoK) in 2013. This initiative aims to generate bring online approximately 1,500 MW of new additional geothermal capacity by 2017 from the current capacity of approximately 200 MW (MoEP, 2013). In the longer term, Kenya's Vision 2030 states an ambition of 50000 MW of installed geothermal capacity by 2030.

Although there is significant ambition and political will, reaching the short, medium and even long-term geothermal ambition will be a major challenge.

According to the Business As Usual (BAU) scenario defined in the NCCAP, geothermal power will continue to expand to approximately 2500 MW by 2030 (NCCAP, 2012). This falls well short of Kenya's stated ambitions.

If the geothermal sector fails to deliver new capacity in a timely manner, Kenya is likely to prioritise alternative options. Recent discoveries of petroleum, coal and natural gas indicate that fossil fuels likely will increase in the electricity generation fuel mix. As high carbon intensity power sources, this would put the Kenya power sector on a high-carbon development pathway.

There is, however, an accelerated growth scenario for geothermal power development in the NCCAP, which this NAMA intends to support. This accelerated growth scenario foresees significant up-scaling in private sector investment, as well as new actors (developers and Independent Power Producers [IPP]) entering the sector. In the scenario, the private sector will need to cover approximately 40-50 % of the required USD 20 billion investment to reach the 5,000 MW goal, compared with the historical 10-15% level (NCCAP, 2012).

The BAU scenario in the NCCAP analysis identified two main constraints to the accelerated scenario: capital limitations of current (largely publically

owned and financed) geothermal developers active in Kenya, and the limited number of private sector developers.

In recent years, Kenya has already undertaken significant steps to support the transition towards the accelerated scenario (the ‘transformation’), including the establishment of the Geothermal Development Company (GDC) that seeks to promote development of geothermal with large private sector participation. However, engagement with Kenyan stakeholders, international IPPs and developers, potential investors and development banks indicated that significant gaps remain in the support for geothermal development.

What are the gaps and how is the NAMA designed to support on-going efforts to transform the Kenyan geothermal sector?

Three main gaps in the efforts to support increased private participation were identified during a sector analysis performed through a multi-stakeholder consultation process that began in September 2012 and continued for over 16 months. These three gaps include an inadequate risk / return profile for IPPs and other developers, a need for targeted technical assistance focused on commercial and financial aspects in the short and medium term, and a potential human capacity gap for large up-scaling of the sector in the medium and long term.

The NAMA aims to address the gaps in the existing and on-going effort to transform the sector through new, complementary, ‘low-regret’ actions. The NAMA proposes four specific components:

Financial 1) Risk mitigation instruments –Three sub-components are proposed for the early stage risks: Provision of contingent grants, complemented by a drilling risk insurance, and a Long Term Risk (LTR) guarantee.

Financial 2) Premium payment mechanism –A premium payment mechanism would entail disbursement of a pre-defined additional income per MWh to increase financial attractiveness on specific fields for a limited period.

Capacity 1) Technical Assistance Facility –A Technical Assistance Facility (TAF) will provide advisors, training, secondments and workshops addressing IPP integration, mobilising finance and expediting environmental and social approvals.

Capacity 2) National Geothermal Capacity Building Programme - The NAMA will support a National Geothermal Capacity Building Program that undertakes training, research, mapping, planning and database development.

The new, complementary components of the NAMA, in the short and medium term, will directly target an estimated 820 MW of geothermal developments of the 1500 MW outlined in the 5000MW+ in 40 months initiative. They will also indirectly support achievement of the longer term ambitions in the long term.

In terms of greenhouse gas (GHG) mitigation potential, the NAMA will contribute to directly abating approximately 3.77 MtCO_{2e} per year in 2020.

Sustainable development co-benefits of the NAMA include improved energy security through increased domestic supply, GDP growth through lower energy prices and increased employment. Climate resilience will be improved insofar as the electricity supply will be less dependent on hydroelectricity, and thus less exposed to changes in precipitation patterns due to climate change.

A.4 Sector

<input checked="" type="checkbox"/> Energy supply	<input type="checkbox"/> Transport and its Infrastructure
<input type="checkbox"/> Residential and Commercial buildings	<input type="checkbox"/> Industry
<input type="checkbox"/> Agriculture	<input type="checkbox"/> Forestry
<input type="checkbox"/> Waste management	

Other

A.5 Technology

<input type="checkbox"/> Bioenergy	<input type="checkbox"/> Cleaner Fuels
<input type="checkbox"/> Energy Efficiency	<input checked="" type="checkbox"/> Geothermal energy
<input type="checkbox"/> Hydropower	<input type="checkbox"/> Solar energy
<input type="checkbox"/> Wind energy	<input type="checkbox"/> Ocean energy
<input type="checkbox"/> Carbon Capture and Storage	<input type="checkbox"/> Low till / No till
<input type="checkbox"/> Land fill gas collection	

Other

A.6 Type of action

<input checked="" type="checkbox"/> National/ Sectoral goal	<input type="checkbox"/> Project: Investment in machinery
<input type="checkbox"/> Strategy	<input type="checkbox"/> Project: Investment in infrastructure
<input type="checkbox"/> National/Sectoral policy or program	<input type="checkbox"/> Project: Other

Other

A.7 Greenhouse gases covered by the action

<input checked="" type="checkbox"/> CO2	<input type="checkbox"/> CH4
<input type="checkbox"/> N2O	<input type="checkbox"/> HFCs
<input type="checkbox"/> PFCs	<input type="checkbox"/> SF6

Other

B National Implementing Entity

B.1.0 Name

Lead agency: Ministry of Energy and Petroleum

B.1.1 Contact Person 1

Chief Geologist, Geoexploration department

B.1.2 Address

B.1.3 Phone

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B.1.4 Email

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B.1.5 Contact Person 2

Managing Director, Geothermal Development Company(GDC)

B.1.6 Address

B.1.7 Phone

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B.1.8 Email

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B.1.9 Contact Person 3

Ag. Director, Climate Change Secretariat

B.1.10 Address

B.1.11 Phone

B.1.12 Email

fmohamed@environment.go.ke

B.1.13 Comments

Other relevant stakeholders:

KenGen; Energy Regulatory Commission; Kenya Power; The National Treasury Kenya; Ministry of Devolution and Planning; Private developers; Technical and financial development partners; International organisations

C Expected timeframe for the implementation of the mitigation action

C.1	Number of years for completion	15
C.2	Expected start year of implementation	2014

D Currency

D.1	Used Currency	<input checked="" type="checkbox"/> AED
		Conversion to USD: 1

E Cost

E.1.1	Estimated full cost of implementation	4250000000
E.1.2	Comments on full cost of implementation	3.315-4.250 billion USD equivalent to total costs of 820 MW of additional geothermal above BAU
E.2.1	Estimated incremental cost of implementation	1300000000
E.2.2	Comments on estimated incremental cost of implementation	1.3 billion USD (includes components seeking additional support and non-supported 'domestic' components)

F Support required for the implementation the mitigation action

F.1.1	Amount of Financial support	288300000
F.1.2	Type of required Financial support	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Guarantee <input type="checkbox"/> Loan (sovereign) <input checked="" type="checkbox"/> Equity <input type="checkbox"/> Loan (Private) <input type="checkbox"/> Carbon finance <input checked="" type="checkbox"/> Concessional loan <input type="checkbox"/> Other <input type="text"/>
F.1.3	Comments on Financial support	Phase 1: 7.8 – 10.5 million USD /Phase 2: 172 - 278 million USD Phase 1: Grants / Phase 2: Grants, convertible equity, concessional loans Phase 2 volume and nature of support to be determined in detail in phase 1.
F.2.1	Amount of Technological support	N/A
F.2.2	Comments on Technological support	N/A
F.3.1	Amount of capacity building support	
F.3.2	Type of required capacity building support	<input type="checkbox"/> Individual level <input checked="" type="checkbox"/> Institutional level <input type="checkbox"/> Systemic level <input checked="" type="checkbox"/> Other <input type="text"/> Human Capital
F.3.3	Comments on Capacity Building support	Financial support required to deliver capacity support has been translated into financial support and included in point F.1.1. Phase 1: 5 FTEs per year, 1600 man/days technical support Phase 2: 28 FTEs per year
F.4	Financial support for implementation required	<input type="checkbox"/>
F.5	Technological support for implementation required	<input type="checkbox"/>
F.6	Capacity Building support for implementation required	<input type="checkbox"/>

G Estimated emission reductions

G.1 Amount	3.77 (2020)
G.2 Unit	MtCO ₂ e/yr
G.3 Additional information (e.g. if available, information on the methodological approach followed)	Based on 820 MW directly supported by new NAMA components, however NAMA likely to indirectly support further MW beyond 2020, and thus greater emissions reductions.

H Other indicators

H.1 Other indicators of implementation	Greater MW online of geothermal compared with BAU, Average electricity prices, Number of permanent jobs created, Number of private sector firms engaged in geothermal electricity generation, Changes in wildlife population numbers, Loss or change of plant species, Number of temporary jobs created, Number of community members relocated, Number of people with access to electricity, Amount of electricity generated, Percentage of geothermal in the national energy mix, Development process duration - amount of time to achieve key steps in development process (i.e. reduction in lead time)
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I Other relevant information

I.1 Other relevant information including co-benefits for local sustainable development	The NCCAP reaffirms that increasing the share of geothermal power can provide low-cost base load generation while facilitating economic activity and development, such as increased access to energy. These are key aspects with regard to supporting Kenya's ambitions to become a middle-income country by 2030 through the provision of reliable, affordable and sustainable energy. In particular, geothermal power generation will play a key role in reducing the current reliance on hydropower, thereby improving climate resilience.
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J Relevant National Policies strategies, plans and programmes and/or other mitigation action

J.1 Relevant National Policies	<p>5000+ MW in 40 months initiative (2013), Ministry of Energy and Petroleum</p> <p>Government of Kenya (2007). <i>Kenya: Vision 2030</i>. Nairobi: Ministry of Planning and National Development and the National and Economic Council, Office of the Prime Minister. http://www.vision2030.go.ke/</p> <p>Ministry of Energy (2012). <i>National Energy Policy – third draft</i>. Nairobi: MoE.</p> <p>Government of Kenya (2012). <i>Kenya's Climate Change Action Plan</i>. Available at: http://www.kccap.info/.</p> <p>Government of Kenya, Ministry of Energy (2011). <i>Updated Least Cost Power Development Plan</i>. Nairobi</p>
J.2 Link to other NAMAs	.

K Attachments

K	Attachments	Title Description
K.1	Attachment description	
K.2	File	<input type="text"/> <input type="button" value="Browse..."/>

L Support received

L.1 Outside the Registry											
L.2 Within the Registry	<table border="1" style="width: 100%;"> <thead> <tr> <th>Support provided</th> <th>SupportType</th> <th>Amount</th> <th>Comment</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Support provided	SupportType	Amount	Comment	Date					
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