(marmanie) Impact Investing & Advisory

Assessing the structural capacity requirements that would allow developing countries to participate in evolving carbon markets

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& APPENDICES

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APPENDICES

Appendix 1: Terms of Reference

Assessing structural capacity requirements that would allow developing countries to participate in carbon markets

Aim of the work

To enhance our understanding of the structural, institutional and technical capacity that developing countries have and will need in order for them to participate in a reformed Clean Development Mechanism (CDM) and proposed new sectoral mechanisms.

Background

The Clean Development Mechanism (CDM) is currently the main tool for developing countries to participate in the carbon market. It works by allowing companies and governments in industrialised countries to purchase credits for projects that reduce emissions in developing countries. However, participation in the CDM has been dominated by a handful of developing countries, while many others have seen little benefit from the CDM and its flows of finance.

The UK is pushing for a number of reforms to the CDM that would help to improve its efficiency, effectiveness and environmental integrity. However, there is a risk that many developing countries will still not be able to benefit from the CDM if they lack the capacity to participate.

Furthermore, the UK is pushing for agreement to establish new sectoral crediting and trading mechanisms that work on a much larger scale than the CDM and would vastly expand the opportunities for developing countries to benefit from the carbon market. In the case of sectoral trading mechanisms, this could mean advanced developing countries taking on binding targets for particular sectors of their economies e.g. power generation. For developing countries not able to commit to a binding cap, sectoral mechanisms would allow for crediting of emission reductions below a "no-lose" crediting target baseline. There would be no consequences for failing to reach the target. It is widely assumed that the least developed countries would not have the capacity to engage in sectoral mechanisms.

Currently the majority of advanced developing countries are opposed to these new mechanisms. An understandable concern is that it is currently unclear what capacity they would need in order to participate in and benefit from these new mechanisms.

The DfID White Paper, "Building our Common Future", recognises the role to the carbon market in supporting low carbon development in developing countries and highlights the need for capacity building support to enable developing countries to participate more fully in carbon markets. However,

more research is needed into what capacity is required in order for developing countries to maximise their access to carbon markets, and for the international community to better target their support.

Key research questions

The overall research question is:

What capacity will be needed, and what capacity currently exists, in developing countries in order for them to participate in 1) a reformed CDM; 2) sectoral crediting mechanisms; 3) sectoral trading mechanisms?

Additional questions which will need to be considered are:

- What lessons have been learnt to date from participation in the CDM? Which countries have been able to participate and which have not. What are the critical factors that have enabled, and barriers that have prevented, participation?
- Are there likely to be different/additional capacity requirements for participation in a reformed CDM?
- What are the MRV requirements that would enable a developing country to move from the CDM to sectoral mechanisms?
- What is the current institutional & technical capacity (including in terms of personnel) of key countries to accurately measure, report and verify emissions in key sectors?
- What are the structural issues, including those relating to market structures and governance, that will determine countries' ability to participate in new (sectoral) mechanisms?
- What is the current legal and institutional capacity to implement emissions trading and related instruments?
- How could the gap between current capacity and required capacity be filled in the short, medium and longer term?
- How could new mechanisms be designed or implemented in order to encourage maximum participation by developing countries? Are there ways of designing or implementing mechanisms to mitigate against some of the capacity constraints identified?

Design, methods and data collection

This is research that will address a knowledge gap in a priority knowledge area. Researchers will need to engage with the large and general literature on capacity building, as well as existing literature on capacity building for the CDM, in order to avoid overlaps.

The proposed study would include two broad outputs:

- a synthesis of existing research on capacity requirements for carbon market engagement in developing countries. This would include a review of the literature on capacity requirements, gaps in capacity, plus an assessment of capacity building activities already underway (e.g. technical assistance, direct funding, workshops), and an assessment of the success of these activities.
- applying the insights gained from the literature review to selected developing countries to identify capacity requirements, existing capacity and capacity constraints to engage in CDM, sectoral crediting mechanisms and sectoral trading mechanisms. Insights from related ongoing research will also need to be taken into account as findings emerge.

The work will be funded by DFID but with the intention that it will be shared with key partners. It could potentially be used as an influencing tool and so will be presented in politically neutral terms so as not to alienate key partners.

Outputs and reporting

The researchers will be expected to deliver outputs that address the research questions highlighted above.

Specific deliverables will include:

- a minimum of three meetings with the project steering group: a kick-off meeting, a meeting to discuss the interim report and a meeting following submission of the final report;
- an interim report setting out the initial findings and results (expected mid-way through the project);
- a final report clearly setting out the key findings/recommendations in an executive summary; and
- a workshop to discuss and disseminate the findings/recommendations.

We would expect to publish the final report online. We would also expect the researchers to take advantage of other channels for disseminating the results, for example, through resource centres and through the publication of working papers and/or journal articles.

Timing/user engagement

This work is expected to take place over a 3 month period, delivering in February/March 2010. We anticipate the report will be published on the DFID website and disseminated to relevant stakeholders. A workshop will be held at the end of the research to consider the major findings. Key DFID/DECC stakeholders and others will be invited to this.

Skills and personnel

The research team will need to demonstrate that they have the experience and skills to enable them to successfully complete the scope of works within the required timescale. In particular, they will need to demonstrate:

- A good knowledge of existing carbon market mechanisms, including the CDM and emission trading systems;
- Knowledge of the ongoing climate change negotiations, in particular, proposed reforms to the CDM and proposals for new mechanisms; and
- Broad understanding of approaches to development.

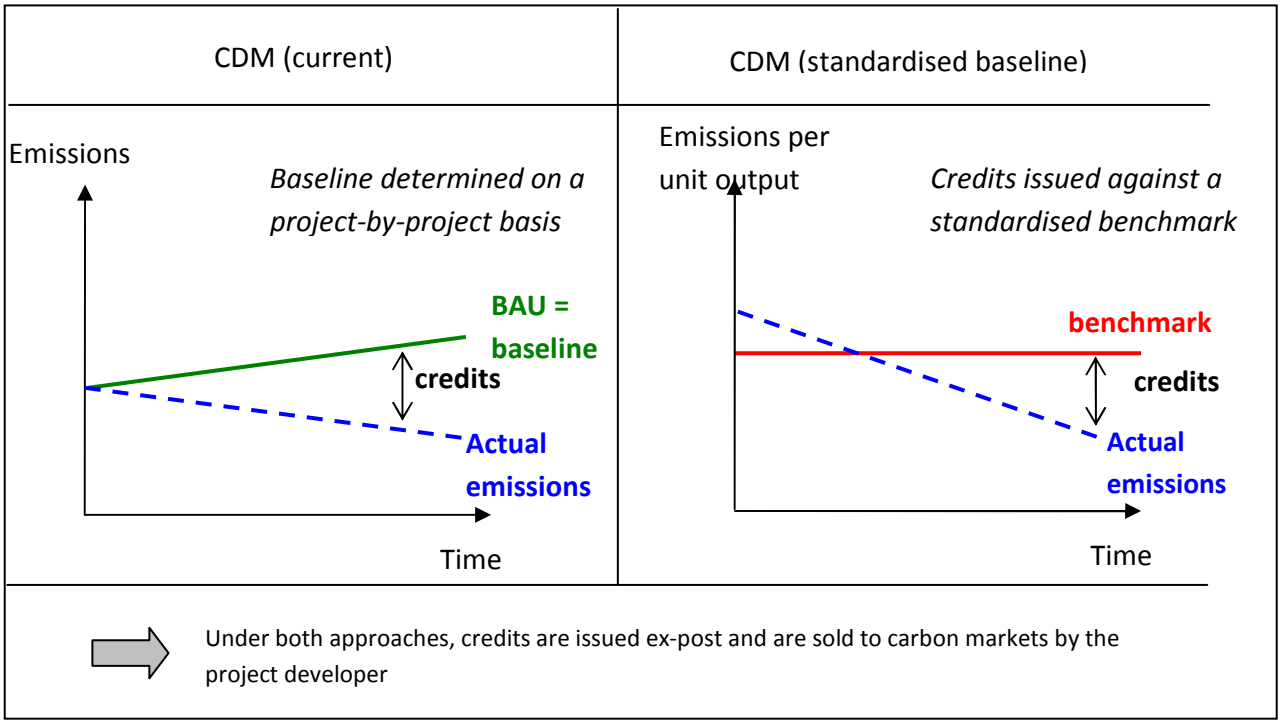
Bidders should name the key staff they propose to use for the work and provide copies of their CVs (no more than 3 pages). We encourage consortiums and are happy for potential applicants with different experiences to collaborate.

Annex 1: Background

The recent report on carbon trading by the Prime Minister's special representative, Mark Lazarowicz MP, has set out a phased approach for realising the UK vision for a global carbon market. A key element of realising the UK vision will be an increased involvement in carbon markets in developing countries through the introduction of new mechanisms – sectoral crediting and trading - that can scale up the emission reductions and financial flows to developing countries. CDM will continue to play a role, and it is envisaged that it play a growing role in the least developed countries where structural issues have restricted its deployment. It is widely assumed that such countries will not be ready to establish new sectoral mechanisms in the medium term. The UK and the EU are seeking an international agreement in Copenhagen in December that would provide for the establishment of new mechanisms in addition to reforming the CDM.

To ensure that all developing countries, including the least developed, have the opportunity to benefit as much as possible from the carbon market there is an urgent need to identify the capacity issues likely to affect participation in various new mechanisms and to develop an appropriate policy response. While previous research has focused on what training might support capacity building, there is a lack of understanding about how wider structural issues would affect participation. Work in this area would also help inform individual developing countries' thinking about what they should be looking for from an international agreement.

Appendix 2: Comparison of credit generation for current and reformed CDM

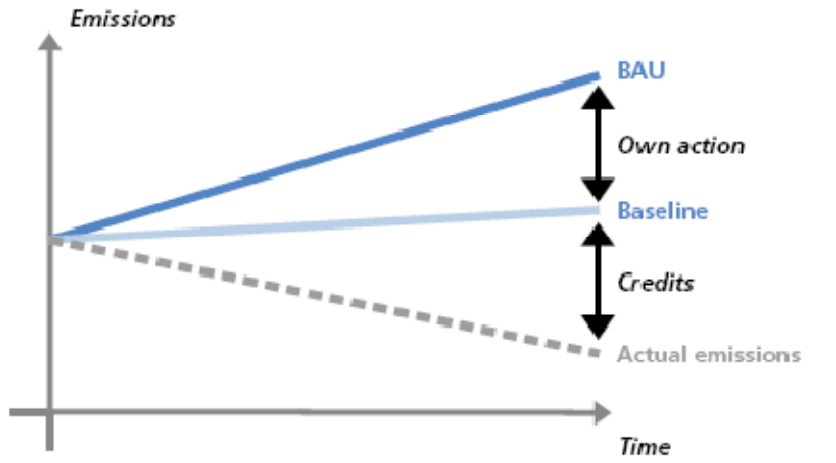


The above figure illustrates how credits are generated under a reformed CDM compared to the current mechanism. It is important to note that under both the CDM and reformed CDM, credits are issued ex-post and sold to the carbon markets by the project developer. It is hoped that greater use of standardised baselines could help simplify both the process of establishing the current CDM BAU (i.e. Business As Usual) emissions baseline and the process of demonstrating 'additionality'. With the current CDM, the methodologies used to determine project baselines and emission reductions are applied on an individual project basis which makes the process complex, costly and very time consuming. Furthermore, additionality is often very difficult to prove as there is a lack of clarity and guidance from the EB on additionality testing, which leads to an inconsistent test application among project developers (Hayashi et al., 2009, p.15). With reformed CDM, the additionality verification is much simpler: if a project beats a specific performance standard, it is deemed additional. This reduces both time and the risk of inconsistent data collection as there would be one pre-approved methodology for each sector.

Appendix 3: setting performance standards for reformed CDM

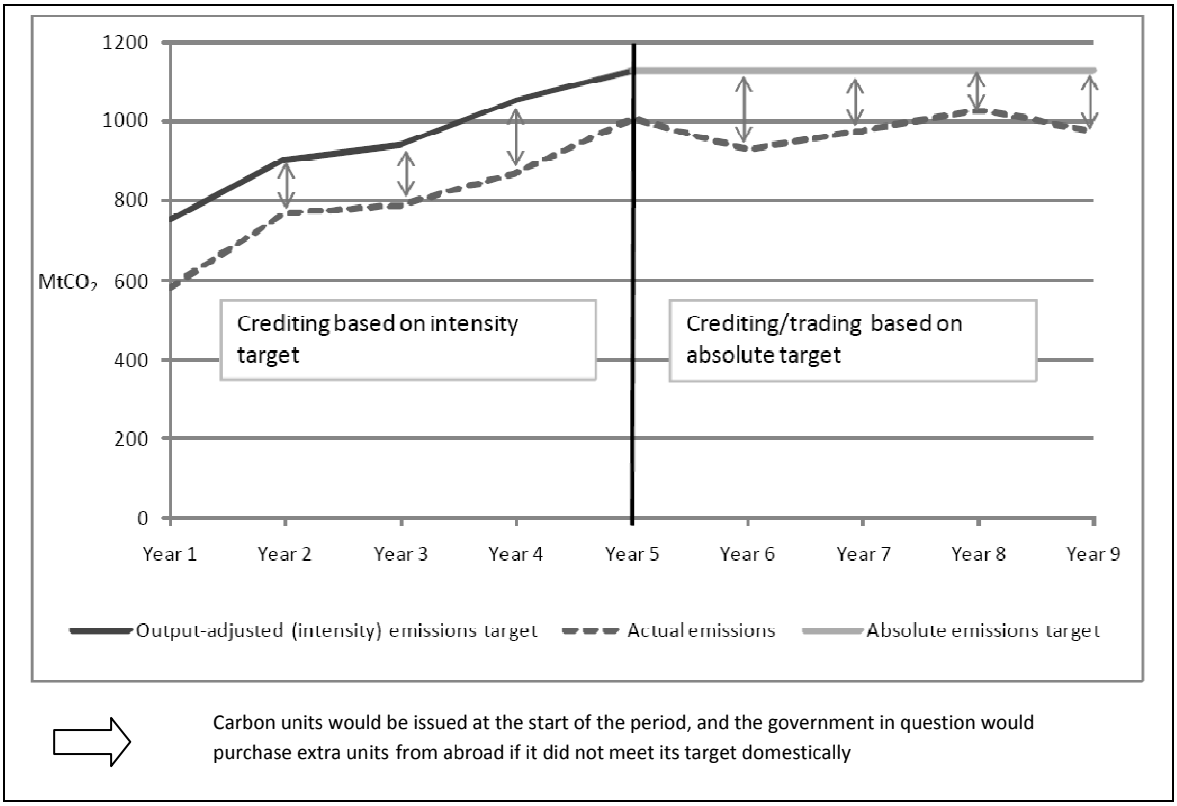
The choice of 'performance indicator' (i.e. tonnes CO_2e/tonne of steel) and the level at which the baseline is set are critical, as this will influence the level of take-up and the degree to which the credits that are issued reflect real emissions reductions. In general, the more stringent a benchmark, the more likely emissions reductions are real and additional, but the harder it is to meet the benchmark, hence lower expected take-up of projects. A less stringent benchmark requiring less mitigation effort is more negotiable, but implies a greater risk that credits will be issued for emissions reductions that would have taken place anyway. Achieving the right balance between setting achievable benchmarks to encourage participation and ambitious baselines to reduce emissions is a delicate challenge for the international community. This is an area where political negotiations around baseline setting will have to be particularly sensitive to developing countries' concern over implementing systems that could inhibit their competitive advantage for economic growth.

Appendix 4: Illustration of Large Scale Crediting (Lazarowicz, 2009)



Carbon units would be issued at the end of the period if emissions have been lowered below the baseline. The government would not need to purchase extra carbon units if the country failed to meet its baseline

Appendix 5: illustration of the transition from large scale crediting to trading (source Aasrud et al., 2009)



Appendix 6: MAPS - Mitigation Action Plans and Scenarios

The 'MAPS' project, Mitigation Action Plans and Scenarios has chosen Ghana as one of its countries. This project is looking at a number of developing countries all at different stages of development.[8] The project is focused on helping DC's by sharing the knowledge that the MAPS team gained during the South African Long Term Mitigation Scenarios (process).

MAPS will offer:

1) Direct assistance in research, modeling or reviewing long term mitigation scenarios.
2) Direct assistance in process design, where needed
3) Collaboration: MAPS has plans to bring value through the sharing the knowledge gained from working across six countries over the next five years.

For countries that have made pledges under the Copenhagen Protocol, MAPS will be able to use a scenario approach that aims to reveal options to achieve the pledge. MAPS will explore methodological approaches that are appropriate for each country.

MAPS is at the scoping stage but if funded this type of private sector intervention could prove very helpful in Ghana. This programme represents a possibility to gather specific country data, identify country appropriate methodologies and apply this knowledge/capacity to the adaptation and mitigation plan identified in the LCGP. It also offers the possibility of knowledge transfer gained from sharing the experiences of others countries going through the same process.

It is import to note that whilst programmes like MAPS provide much needed capacity for data collection and management, they can only be successful if they are part of a transparent and coordinated government process that works efficiently with the private sector and academic institutions to gather and house data in a central data base.

Appendix 7: List of Interviewees

ORGANISATION	NAME	TITLE	COUNTRY
Arborcarb	Alex Holroyd-Smith		Ghana
Climate Change Unit	Paul Isabirye		Uganda
Climate Change Unit, Ministry of Water and Environment	Chebet Maikut	Principal Programme Officer-Mitigation	Uganda
co2balance	Mark Simpson		General
DECC	Tom Bouwens	Projects Advisor	General
DFID Uganda	Rob Rudy		Uganda
DNA Uganda	Philip Gwage		Uganda
Ecobank	Musa Salah	International Organisations Department	General
EcoSecurities	Jade Feinberg	Project Manager	General
Embassy of The Netherlands	Dr Ton van der Zon	First Secretary – Environment and Water Advisor	Ghana
Energy Commission	Kofi Agyarko	Principal Programme Officer	Ghana
Energy Commission	Alfred K. Ofosu Ahenkorah	Executive Secretary	Ghana
Environment Protection Agency	Jonathan A. Allotey	Executive Director	Ghana
Forestry Commission	Roselyn F. Adjei	Asst. Programme Manager CDM	Ghana
Parliament of Uganda	Honourable David Ebong	MP Maruzi Constituency Apac District	Uganda
Kite	Ismael Edjekumhene	Director	Ghana
SGS	Pietro Berno	Environmental Manager	Ghana
Standard Bank	Muyi Kazim	Head, Carbon origination - Africa	General
The Katoomba Group	Rebecca Ashley Asare	Coordinator	Ghana (General)
Uganda Carbon Bureau	Bill Farmer	Chairman	Uganda
Uganda Investment Authority (UIA), Land Development Division	Godfrey Ssemakula	Deputy Director	Uganda
UK High Commission-Uganda	Philip Mani	Deputy High Commissioner	Uganda
WELLAMP COMPANY LTD	Raphael Felli	Managing Director	Ghana
West Africa Fair Fruit Company	Rob Moss	Commercial Director	Ghana
World Bank	Peter J. Kristensen	Sector Leader, Sustainable Development	Ghana

Appendix 8: Submission of Appendix II of the Copenhagen Accord (NAMAs)

FROM :MIN. OF ENV'T. SCI. & TECH. FAX NO. :+23321662533 16 Feb. 2010 05:59PM P1

In case of reply, the Number and date of this Letter should be quoted.

Republic of Ghana

Ministry of Environment, Science & Technology
P.O. Box M232
Accra

February 15, 2010

The Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC)
P. O. Box 260124
D-53153 Bonn
Germany
Phone : +49 228 815 1000
Fax : +49 228 815 1999
E-mail : secretariat@unfccc.int

Dear Sir,

SUBMISSION OF APPENDIX II OF THE COPENHAGEN ACCORD

In furtherance to our notification of willingness to be associated with the 18th December 2009 Copenhagen Accord, Ghana is pleased to submit a list of what it considers as nationally appropriate mitigation actions (NAMAs) as per the annex to this letter .

This initial list of NAMAs requires further detailed analysis, in particular as it relates to the actual levels of emissions reductions as a result of the implementation of these actions.

Moreover the analysis will provide further indications as to what actions can be undertaken domestically and which of these actions will require international support in terms of technology, finance and capacity building for the purpose of fulfilling the measurability, reportability and verifiability of actions and support.

We will communicate to the Secretariat as we develop further our mitigation actions.

The Government of Ghana avails itself of the opportunity to renew to the Secretariat of the UNFCCC, the assurance of its highest consideration.

HON. SHERRY AYITTEY (MS)
MINISTER

List of Nationally Appropriate Mitigation Actions in Response to "Article 5" of Copenhagen Accord

Appendix II of Copenhagen Accord (COP 15)

Non-Annex 1 Party – Ghana

Sector	Sub-Sector	Category	Business As Usual Situation	List of Mitigation Actions
Energy	Electricity	Supply	Thermal generation using light crude oil	Switch to natural gas (Combined cycle)
			Hydro generation	Retrofit existing hydro dams
				Build more hydro dams
			Off-grid/ independent generation using diesel and gasoline	Improve reliability of electricity supply by improved maintenance, timely expansion and upgrading
				Expand grid access to discourage the need for off-grid generation
			Generation from conventional sources	Promote electricity generation from renewable energy sources to increase the share of renewable to 10-20 percent by 2020
		Transmission	Transmission Losses (5% – 6%)	Reinforce transmission systems to reduce transmission losses to 3%
				Balance the generation and transmission system
		Distribution	Total distribution system losses (26%)	Standardise transformers
				Expand and maintain distribution systems timely basis
		End-Use	Inefficient appliances and practices	Develop and enforce standards and labels for appliances
				Intensify public education on energy conservation
			Use of kerosene for lighting and cooking	Promote and support Solar PV Lighting
				Increase rate of rural electrification
			High preference for use of private vehicles	Incentivise the use of public transport and promote car pooling
		Fuel Use	Poor maintenance Practice	Enforce road worthiness certification requirements.
				Retrofit existing refinery infrastructure and ensure that new refinery produce non-metallic based gasoline
			High proportion of vehicle population use metallic-based gasoline	Substitute the use of gasoline with CNG, LPG, and electricity for public transport
			Predominant use of gasoline and diesel fuels	Promote the production and use of bio-fuels as transport fuel
		Vehicle Technology	Predominant use of Conventional - Euro II vehicles (manufactured before 2004)	Promote the use of Euro III and above as well as use Flexi Vehicles. Institute measures to promote and switch from the use of gasoline and diesel fuels to use of CNG, LPG, and electricity for public transport
	Residential	Cooking	High percentage of wood fuel (Charcoal and firewood) use	Promote the use of LPG
			Use of inefficient cooking device	Promote the use of energy efficient cooking devices
			Inefficient carbonisation technology	Promote the use of efficient and clean carbonisation

				technologies
			Unsustainable harvesting of wood	Establish more woodlots
				Promote the re-use of wood residues
	Industrial	Manufacturing industries	Low power factor and inefficient energy and other resource utilization	Improve power factor correction across industries and institute energy efficient measures in industrial operations
				Improve on resource efficiency in industries to promote sustainable production and consumption
	Liquid and gaseous Fuels	Oil and Gas production	Fugitive and other greenhouse gas emissions associated with oil and gas production and utilization	Promote zero fugitive emissions
				Assess, promote and incorporate carbon capture and storage in oil and gas production and utilization
Industrial Processes	Metal Production	Aluminium Production	Carbon dioxide is generated in association with aluminium smelting as a result of anode paste used as reducing agent	Reduce carbon dioxide emissions from anode reactions
Agriculture	Crop Production	Land Preparation	Uncontrolled burning	Promote spot and zero burning practices
			Mechanised land preparation	Promote minimum tillage
				Incentivise use of bio-fuels for mechanised agriculture
		Cultivation	Use of nitrogen-based fertilizers	Promote the use of organic fertilizers
				Promote integrated use of plant nutrients
			Predominant cultivation of rice in low lands	Promote the cultivation of high yielding upland rice cultivation
		Harvest to post-harvest	Burning of crop residues	Promote the recycling of crop residues
			High post-harvest losses	Improve storage facilities and promote the use of post-harvest technologies

LULUCF	Forestry	Land Conversions	High decline in natural forest estates	Promote sustainable forest management
				Implement REDD++ mechanism
				Implement various forest governance initiatives (Voluntary Partnership Agreement and Forest Law Enforcement Governance and Trade, Non-legally binding instrument)
				Rehabilitate degraded wetlands
				Develop and enforce land use plans
		Degraded forest lands	Low rate of rehabilitation of degraded forest lands	Enhance rehabilitation of degraded forest lands
				Promote Small Afforestation/reforestation activities at the community level
				Establish commercial plantations
Waste	Solid Waste Disposal	Landfill	Net methane emission due to improper management of waste	Promote waste separation and composting
				Support waste-to-energy initiatives (sawdust, oil palm waste and other agricultural waste /residue)
				Capture and utilise methane gas from landfill sites
				Institute measures to minimise waste generation
	Waste water handling	Domestic and industrial	Inadequate and poorly maintained waste water treatment plants	Build, operate and maintain waste water treatment plants
			Improper disposal of sludge	
			Irregular operation and maintenance	

Appendix 9: CDM project pipeline in Ghana

Table 1: CDM project pipeline

ID	Title	Status	Type	Methodology	2012 ktCO2e (ktons of carbon dioxide equivalent)	2020 ktCO2e (ktons of carbon dioxide equivalent)
CDM5479	Large scale oilseed crop cultivation at Yeji in the Pru district	At validation	Reforestation	AR-AM5[1]	1553	22403

Source: www.cdmpipeline.org (2010)

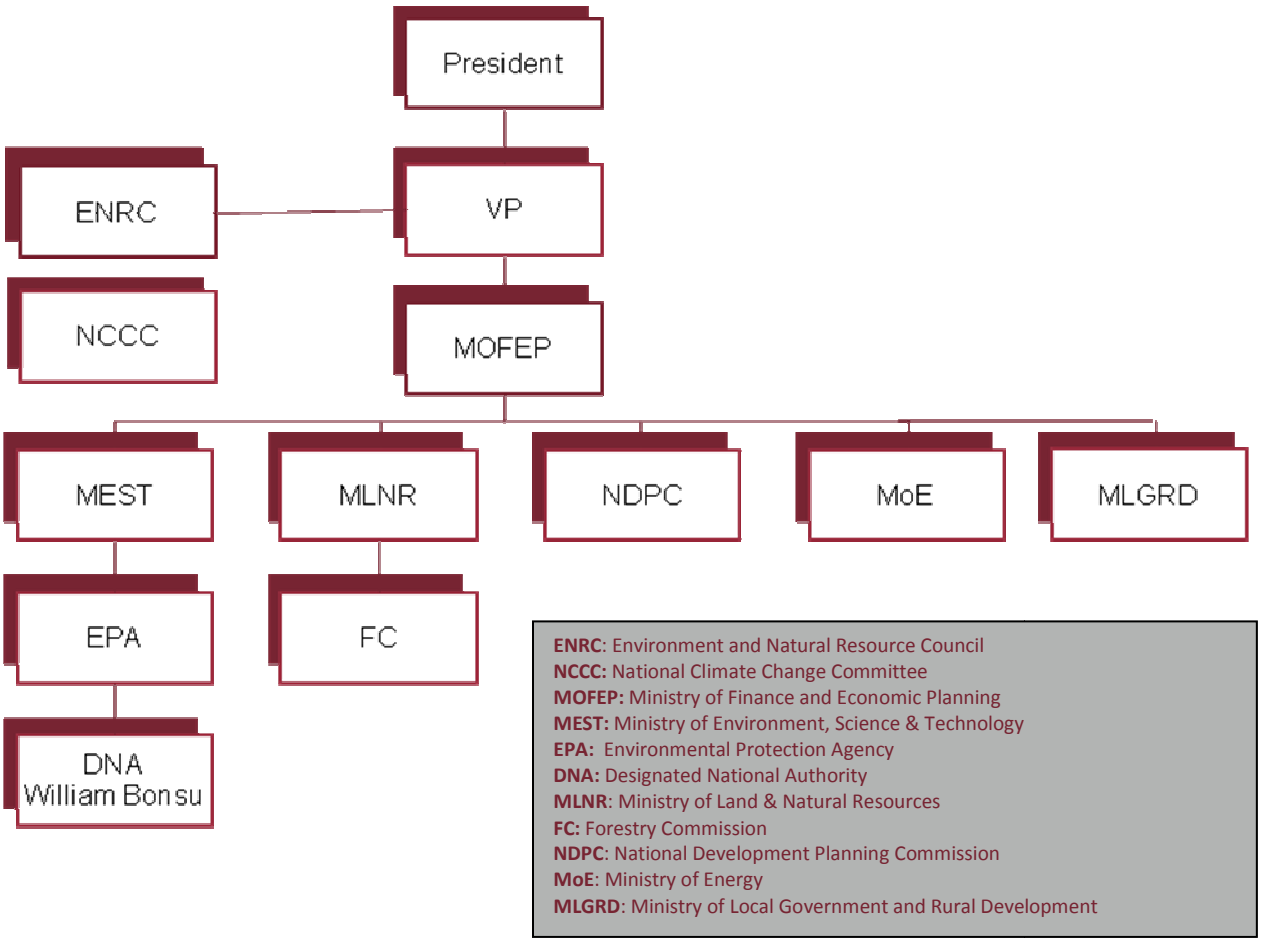
Table 2: Afforestation & Reforestation project methodologies proposed

Meth. No.	Description	GHG red./yr	Title
ARNM23	Community rubberwood reforestation	166 kt CO2	Rubber outgrowing and carbon sequestration in Ghana (ROCS-Ghana)
ARNM29	Community rubber tree reforestation (=ARNM23)	166 kt CO2	Rubber outgrowing and carbon sequestration in Ghana (ROCS-Ghana)
ARNM35	Community rubber tree reforestation (=ARNM29)	250 kt CO2	Rubber outgrowing and carbon sequestration in Ghana (ROCS-Ghana)
ARNM36	A/R CDM baseline and monitoring methodology for reforestation tree plantation by small scale growers in polyculture farming systems (=ARNM35)	250 kt CO2	Rubber outgrowing and carbon sequestration in Ghana (ROCS-Ghana)

Source: www.cdmpipeline.org (2010)

[1] Methodology: AR-AM5 = Afforestation and reforestation project activities implemented for industrial and/or commercial uses

Appendix 10: Ghana's institutional chart (government entities involved in climate change and carbon markets) and contextual information on each of its ministries



ENRC: The Environment and Natural Resources Council is a conventions unit that sits under the Vice President with governmental, private sector and civil society input. It is a staffed unit that could potentially provide a secretariat function for the NCCC/CCC[2], providing strategic supervisory input to the NAMA and climate change agenda. It would probably only meet twice a year but would provide the NCCC/CCC with staffed offices and exposure at the VP level which would ensure a cross-governmental element to the climate/carbon agenda.

NCCC: The National Climate Change Committee has been operational since 2009 and is tasked with coordinating all climate change activities in the country. It has representation from all the necessary government bodies to ensure government wide buy-in, including the Ministry of Finance, Environment, other key Ministries, Agencies, Development Partners and civil society. It has been stated that the NCCC will evolve into a Climate Change Commission in 2010. The specifics of this have yet to be determined, including budget, operational structure, etc.

[2] Because the NCCC is being positioned to evolve into the Climate Change Commission we refer to the NCCC/CCC throughout the case study.

MOFEP: The Ministry of Finance and Economic Planning sits above the other Ministries and has a direct reporting line into the Vice President. The distinction between MOFEP and NDPC is blurry with the responsibility for coordinating local, municipal and national budgets held between them. MOFEP has been named the national implementing entity[3] and the Deputy Minister of Finance has been tasked with climate change oversight. He is looking at Ghana's fiduciary responsibilities with regards to climate/carbon finance and application to the Adaptation Fund. MOFEP missed the recent deadline for submissions and thus will have to submit its request for the May deadline when the criteria for funding is likely to be tougher. If funding is awarded from the adaptation fund, MOFEP will be responsible for dispersing the funds. This would be a departure from what has typically happened in the past, as climate finance has traditionally flowed directly to Mr. Bonsu at the DNA.

MOFEP is technically responsible for the formation and coordination of the Advanced Market Commitments (AMC) which will eventually need to account for carbon opportunities and abatements costs if Ghana is to move towards national benchmarking and large scale new market mechanisms.

MEST: After the NDC came back into power, Ms. Hani Sherry Ayittey was appointed as the Minister of Environment, Science and Technology (MEST). At this same time, the roles and responsibilities of MEST with regards to climate change were enhanced. Throughout 2009, The Honourable Ms. Ayittey focused on increasing her climate change knowledge and Ghana's opportunities to participate in the carbon markets. She has a strong power base and is looking to consolidate and coordinate climate change initiatives under her ministry. She has been instrumental in supporting the National Climate Change Committee and is likely to propose that the NCCC sits inside the ENRC with the ENRC acting as its secretariat. This would then mean that the NCCC sits at the VP level for strategic reasons but reports to MEST for day to day operations and budget oversight. Minister Ayittey is responsible for mandating McKinsey to develop the framework for the LCGP.

EPA: Under MEST, Jonathan Allotey, is the head of the Environmental Protection Agency. He has a strong 'patrilineal' power base and has not historically been a great advocate of climate action or the carbon markets. Organisationally, Mr. Allotey reports into the Ministry but in reality his role/power base allows him to call MEST and other Ministries to task.

The DNA sits within the EPA.

DNA: All day to day responsibilities for climate change and carbon market oversight belong to the DNA. The DNA sits in the Energy Resources and Climate Change Unit within the Environmental Protection Agency under the Ministry of Energy, Science & Technology. Jonathan Allotey is technically the Head of the DNA but in practice all daily activities of the DNA are undertaken by Mr. William Kojo Agyemang-Bonsu, National Climate Change Coordinator. Mr. Bonsu has been the DNA since its formation in 2005. He also serves as Ghana's lead negotiator for climate change related issues.

MLNR: The Ministry of Land & Natural Resources has oversight over forestry and agricultural areas. Although important within the national context, it does not feature heavily in this paper due to the fact that carbon market opportunities for forestry and agriculture are being explored by other parties.

FC: The Forestry Commission sits under MLNR. For the same reasons stated above the FC is not a subject of much discussion in this paper. However, it is interesting to note that Ghana is likely to be one of the

[3] In order to access the adaptation fund board a country must name a national implementing entity that guarantees that they will meet fiduciary standards.

first countries in SSA with a completed REDD Plus Preparedness Plan which is the first step in applying to the Forest Carbon Partnership Facility. The FC plays an important data collection and policy role (with regards to land tenure and liaising with local communities). This demonstrates a level of capacity and public/private sector cooperation that is very relevant for Ghana's overall ability to move towards Government level baselines in key sectors. The REDD plan is moving very quickly right now.

NDPC: The National Development Planning Commission doesn't currently have a lead role in climate or carbon related discussions but there does need to be coordination between NDPC and NCCC/CCC, particularly on a budgetary level. At present carbon finance opportunities, and adaptation/mitigation cost projections have not been built into the national sectoral and/or industrial development budgets that fall under the responsibility of the NDPC and MOFEP. Carbon finance will need to be linked to the NDPC in order to be institutionalised.

MoE: The Ministry of Energy is responsible for setting renewable energy targets, maintain the grid and overseeing Ghana's general energy needs and security. MoE has experience in implementing carbon friendly policy and regulation as demonstrated by its response to the 2007 energy crisis. However, timing constraints and lack of coordination with the DNA meant that these policy tools were not used within a carbon market context.

EC: The Energy Commission regulates all energy suppliers and handles supply side management. The EC has strong professional recognition and works across government relatively independently. The EC has scoped the renewable energy and energy efficiency programmes in the country and is ready to feed these opportunities into a wider carbon market strategy and regulatory framework.

Appendix 11: Ghana Leading the Way: Proposal to Develop a National Low Carbon Growth Plan

Confidential

Ghana Leading the Way: Proposal to Develop a National Low Carbon Growth Plan

Ghana Ministry of Environment, Science and Technology, March 2010

The Ministry of Environment, Science and Technology is preparing for an effort to develop a national Low Carbon Growth Plan (LCGP) for Ghana. This effort will ensure that Ghana's development plan is climate resilient and low-carbon. It will integrate adaptation and mitigation measures into a comprehensive and coherent cross-sectoral plan that brings together current climate initiatives, economic and social development plans and projects across all sectors. Ghana wants to be part of an international solution to the challenges of climate change. Within Ghana each sector of the economy should be part of a national solution.

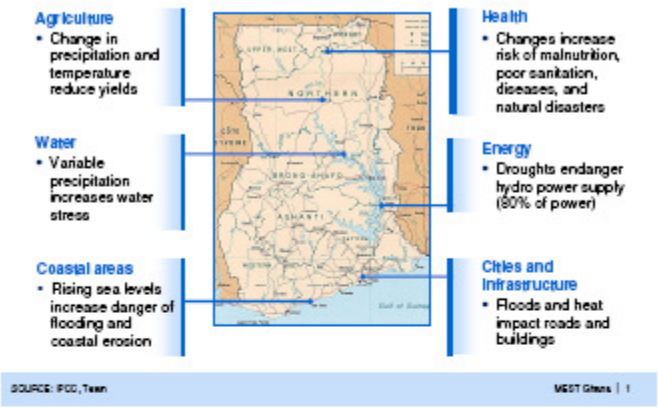
CURRENT SITUATION IN GHANA

Climate change is perhaps the most critical issue of our time – affecting all nations of the world. The Ghanaian people and economy are already feeling its impact, and the situation is forecast to worsen in the near term. Recent floods and droughts demonstrate the potential negative impacts that climate change could have on Ghana with respect to infrastructure, health, energy security, food security and social equity (Exhibit 1). On the other hand, opportunities also exist to harness financial opportunities and to move towards a more integrated mode of development that can more effectively deliver in a more climate-stressed future.

In response, climate change is being increasingly discussed across all sectors. Both public and private players have launched a number of initiatives. These address both adaptation requirements and seize mitigation opportunities. Examples of these initiatives include the UNFCCC submission, a vulnerability assessment, a study on the economics of adaptation or the references to climate change in the Medium-Term National Development Policy Framework. However, so far the existing studies represent some of the buildings blocks for a climate compatible growth plan, but do not add up to a complete and coordinated effort.

Exhibit 1

Ghana faces multiple adaptation challenges



One of the positive outcomes of the Copenhagen Accord is further impetus for adapting development plans to integrate adaptation and mitigation efforts as well as institutional requirements, as well as a willingness to fund the early steps of this process through the Fast Start Fund. These financial flows for adaptation and mitigation measures could be major contributions towards Ghana's development goals. It is just as important to ensure that Ghana is well-positioned to capture international support, highlighting the importance of Ghana developing and implementing systematic processes to address climate change.

Ghana could be in a privileged position to lead the African region on climate change; it is highly regarded in the region in terms of governance and stability and has demonstrated consistent, strong economic growth. Within the international negotiations process Ghana is well regarded technically and politically, particularly within the African Group and G77/China. Furthermore, successful initiatives addressing climate compatible growth, both mitigation and adaptation, are underway in all major sectors including agriculture, forestry, water and energy. However, initiatives are currently fragmented, relatively small scale, and not directly related to sectoral objectives. These initiatives need to be coordinated, made coherent and scaled-up to have even greater impact. In addition, Ghana's efforts to reduce poverty as well as gender and regional disparities must consider the future impacts of climate change.

VISION FOR A CLIMATE COMPATIBLE FUTURE

Ghana has articulated a vision of economic and continuous social development towards middle income status. In the recent months, climate change related topics have become increasingly prevalent in the debate about economic growth and social development. The National Climate Change Forum held on December 2nd demonstrated the attention the country is now paying to climate change. In light of the risks and opportunities presented by the realities of climate change Ghana has decided to develop a vision for climate proof economic development: "Ghana Goes Green". If well defined, we believe that, with this plan, Ghana can lead the African Group in achieving this vision. The vision of 'Ghana Goes Green' includes five policy objectives:

- Achieve economic and social development goals
- Deliver green revolution
- Capture REDD[1] and reforestation opportunities
- Extend renewable energy
- Increase climate resilience

These objectives should guide actions across all sectors, public and private, and be delivered by central government ministries, regions, and communities. However, these policy pillars can not stand on their own but must be based on broad support through:

- Institutions: effective with clear mandates, sufficient resources, required capabilities (including MRV), and supportive guiding policies, building on the efforts of existing institutions
- Knowledge: policy-making supported by national research and development on climate change related issues as well as links to the international knowledge networks
- Voice: expanded, informed and engaged constituency on international as well as national level
- Finance: public financial management systems capable to harness and effectively deploy international financial flows

There are already many of the required prerequisites in place in Ghana (e.g., research on the adaptation challenges), but the pieces need to be connected, coordinated, and complemented to provide a solid basis for the outlined vision. Achieving this vision requires strong early action. We are prepared to start now to achieve growth and development that is both resilient to the impacts of climate change and also proceeds towards a climate-compatible, lower carbon future.

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[1] Reducing Emissions from Deforestation and Degradation

These goals will not be easy to achieve and will require a long-term commitment. Ghana is prepared to make that commitment and aspires to lead the region on developing a low-carbon climate compatible economy. To lead the way on the 'Ghana Goes Green' vision we will also require support from developed and developing countries, development partners, international institutions and local organizations.

Although Ghana is eager to start implementing as soon as possible concrete pilots on the ground to demonstrate its commitment, experience in other countries demonstrates that there is a significant value in investing into a planning phase that will both equip Ghana with a solid fact-based plan and a set of well-functioning institutional processes. We see four benefits to a well-run planning phase

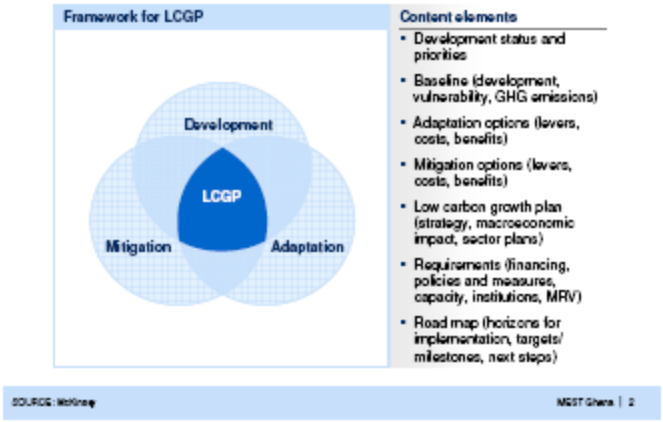
- ***Need to get it right*** – Mitigation and adaptation overlap with development issues and therefore need a holistic review to ensure they fit with the overall development objectives of the country
- ***Better planning, higher efficiency*** – Planning a LCGP will force a prioritization of the actions, a cross-fertilization and an integrated approach, while avoiding fragmentation or duplication of efforts
- ***More prepared, more credible*** – A robust, fact-based LCGP development, combined with a solid capacity building effort, will demonstrate to donor countries/agencies that Ghana has a sound plan to make implementation (and use of future funding) a success
- ***Need to start now*** – The process to allocate the Fast Start Fund from the Copenhagen Accord is ongoing, and countries with solid action plan will be able to absorb this funding first

MAIN ISSUES TO ACHIEVING OUR CLIMATE COMPATIBLE VISION

Achieving this vision for Ghana requires taking some actions now. As the first step to achieving this vision, we are committed to ensure that all our development and sector policies are climate compatible (low emissions and strong climate resilience). The internationally promoted instrument to achieve these objectives is called national Low Carbon Growth Plans (LCGP). Contrary to the widely used terminology, the plan includes all mitigation as well as adaptation opportunities from a development perspective (Exhibit 2). Ghana's LCGP should also have this holistic view on a climate compatible vision.

Exhibit 2

Low Carbon Growth Plan concept



Other countries, like Mexico or Papua-New Guinea, have already started to develop a LCGP. These highly participative programs typically require 9-12 months to get to a stage where local stakeholders have a clear perspective on the main buildings blocks and are ready to push them further into implementation (potentially with development partners). These six build blocks are:

a. **Adaptation**: Identification and assessment of today's and future climate risk under different climate change scenarios, development and prioritization of a full range of risk prevention and risk transfer adaptation levers, and assessment of overall adaptation benefits and cost.

b. **Mitigation**: Development of a mitigation cost curve (2020, 2030) covering levers in forestry, agriculture, power, transport, and, on a high level, oil extraction as well as mining.

c. **Climate Compatible Growth Plan**: Adjustment of a country's economic development vision, strategy, and actions in the context of adaptation challenges, mitigation opportunities, and its stated decarbonization goals. This would include changes in the country's current core sectors (esp. forestry and agriculture), as well as potential expansion in other, lower carbon economic activities that fit, building on its competitive advantages.

d. **Financing**: Assessment of the total cost, opportunity and budgetary, for executing the plan over time, and potential sources of funding.

e. **Institutions**: Detailing the required set-up and processes for institutions driving the national climate change agenda on a continuous basis, assessing the current institutional capabilities, and identifying required adjustments in the institutional framework, leveraging learnings from other similar institutions, like the Amazon Fund.

f. **Syndication and synthesis**: Supporting the syndication of the climate change plan and its synthesis into a coherent document.

Much has already been undertaken or is under way on different aspects of climate change in Ghana. The LCGP should be a holistic effort building on existing knowledge of local and international experts, efforts of government and development partners already underway to address some of the elements and encompassing all sectors of Ghana's economy. The goal is to establish a reference framework that will guide the climate compatible development of the country and avoid duplication/fragmentation of the efforts around this topic.

To make the framework of LCGP more specific to Ghana, while encompassing all sectors of the economy and integrating all existing climate change relating initiatives, earlier work in the country has indicated that a LCGP would need to put strong focus on 4 areas and answer the following important questions across mitigation and adaption:

1. Agriculture & forestry:
   Agriculture is one of the main drivers of deforestation and such a strong emitter of GHG. Additionally, agricultural productivity is highly challenged by the changes in climate patterns and natural disasters such as droughts and floods. Combining both adaptation and mitigation, the focus area of this sector aims to identify ways to increase the climate resilience of agriculture, stop deforestation and increase efforts to restore forests and degraded land areas. Main questions include:
   - How can we achieve food security by implementing a "climate-resilient" green revolution in Ghana?
   - How can deforestation and forest degradation be stopped and reforestation/afforestation scaled up?
   - What are the main challenges to change behaviors and how can we define the adequate incentives system?
   - Which opportunities for financing exist and how can they be harnessed?
2. Energy and transportation:
   Energy use – domestic, industrial, and transportation – drives the majority of the non-land-use related GHG emissions. At the same time Ghana's energy supply with a strong focus on hydro power from the Volta is challenged by increasing droughts and lower rainfall. Finally, poor energy infrastructure decisions made today as Ghana is developing will lock-in

the countries for centuries with the wrong portfolio. Therefore, increasing and diversifying Ghana's renewable energy sources and to increasing its energy efficiency in all sectors is paramount. Main questions to answer include:

- What are the costs and benefits of options for securing future energy supply and for developing a low carbon transportation sector?
- What are the opportunities in renewables and energy efficiency in Ghana?
- How can these opportunities be financed? How can they attract investment from the private sector?

3. Further adaptation issues, across all sectors and areas:
   In addition to the risk highlighted in the agriculture and energy sectors, climate change puts increasing value at risk in other sectors like health, infrastructure and habitat through shifts in temperature and rainfall and increasing frequency of climate hazards (like floods, droughts, bush fires). The focus on adaptation builds on Ghana's existing vulnerability assessment, the adaptation strategy and the economics of adaptation study. Different to the existing work, it looks at adaptation from an insurance perspective, identifying and quantifying all risk factors, estimating the potential damage to people's lives, material goods and physical infrastructure, and providing cost-benefit analysis for potential interventions to prevent losses. Main questions include:
   - What are the risks and costs of the climate vulnerabilities of each sector across the economy and social sectors?
   - What measures are needed to address these?
   - How can adaptation needs be successfully integrated to deliver sector objectives and policies?
   - How can adaptation needs be financed?
4. Institutional environment and capability building:
   The LCGP will look at some overarching issues such as the assessment of current institutional mandates related to climate change issues and making recommendations for a appropriate institutional framework and mechanisms in the future (e.g., converting the National Climate Change Committee into a Climate Commission). The questions on efficient and gradually improved MRV will be critical to develop early actions with measurable impacts, improve and refine the strategy and establish a trust-based relationship with the countries or private sector investing in Ghana. While getting some support from international consultants and development agencies, the main objective of developing the LCGP is to build the critical individual and institutional capacities in our ministries, departments, and agencies with respect to the questions of climate

change. We will design the exercise in a highly participative way and ensure transfer of skills and knowledge from the international experts to our local team, so that by the end of 2010 we have a highly-skilled team of experts across various ministries to help drive implementation and later refinement of the LCGP. In order to strengthen our local capabilities and to ensure true leadership of the various players across all sectors, the process to develop the LCGP needs to by highly participatory involving stakeholders from all groups of society and across all sectors.

PROPOSED APPROACH FOR DEVELOPING GHANA'S LCGP

We propose to develop the LCGP over a 9 month period in 2010 starting with a cross-ministry task force, which will then eventually hand it over to an appropriate institutional home. The process will consist of 3 stages, each of which will be approximately 3 months long, at the end of which Ghana will be equipped with a detailed planning, emerging pilots and an institution design, all of which making the country ready for implementation.

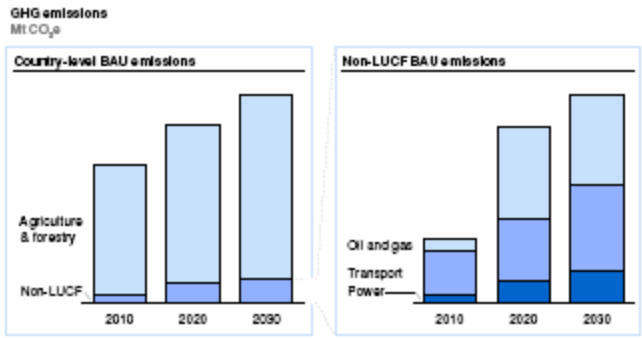
Stage 1: Develop fact base (3 months)
This stage will create the fact base for developing a LCGP. A consistent set of basic figures with respect to the desired economic and social development pathway, the current and expected future emission levels, mitigation opportunities, and levers for adaptation to climate change will be created.

For **mitigation**, the approach will consist in defining a *Business-as-Usual (BAU) scenario* for emissions by 2020 and 2030 (Exhibit 3).

The BAU will take into account the economic development scenario for the country (overall GDP development and sectoral developments) as well as the expected population growth and demographic changes. It will build heavily on the existing national medium term development plan and the corresponding sector development plans that already exist in Ghana. For calculating the emissions, the scenario builds on the national GHG inventory communications that exist or are under development and will focus on creating a fact-based link between the development of Ghana and its emissions.

Exhibit 3

Business as Usual scenario predicts GHG emissions

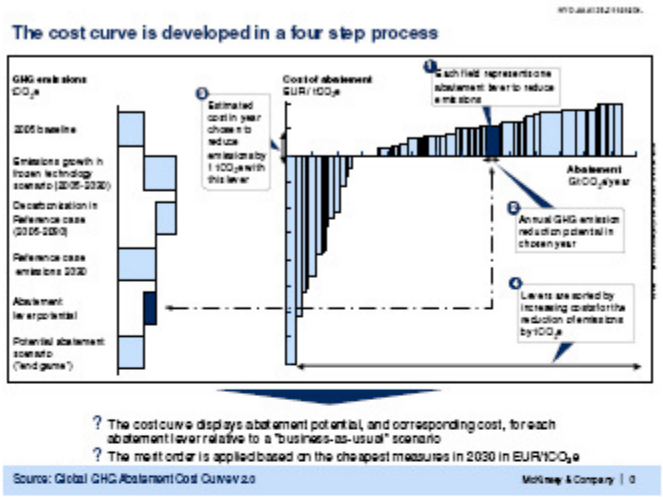


SOURCE: McKinsey MEST Ghana | 3

We will then start from existing programs and our database of mitigation levers from other countries to define a set of mitigation measures. For each lever we will assess their abatement potential, cost, feasibility and their socio-economic impact on the development of the country. The analysis will highlight some important trade-off between the different mitigation 'pathways', balancing the mitigation potential and the economic development of the country. A political decision, based on these analysis, might be needed for some of these trade-offs. Our experience also shows that a series of sector-specific workshops with the relevant stakeholders allow to generate new ideas, help calibrating the cost/mitigation potential with local expertise and generate more buy-in into the end-product.

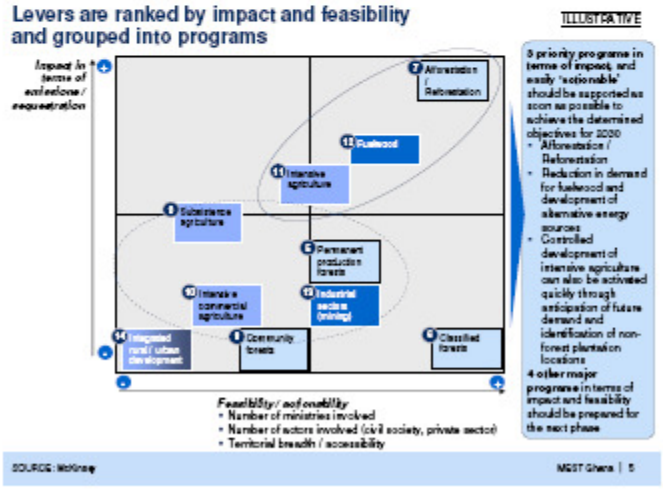
At the end of this stage, a GHG abatement cost curve will summarize the cost-benefit analysis of potential mitigation levers (Exhibit 4). This end-product will be documented with a detailed set of assumptions, accessible to all relevant stakeholders. This allows reviewing the curve at later stage when more data is available and/or when more experience is gathered on the field.

Exhibit 4



A first assessment of the impact and ease of implementation will allow defining the building blocks of the future mitigation plan and their respective prioritization, as a first step toward the creation of a LCGP and its implementation (example for a REDD program on exhibit 5).

Exhibit 5



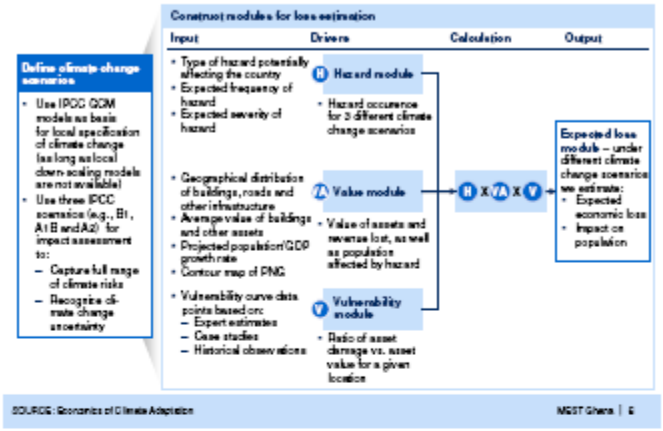
For **adaptation**, the approach will build on Ghana's existing climate change scenarios and the vulnerability assessment as well as the existing adaptation efforts, and will bring a complementary perspective on *value at risk* and *cost/benefit ratio* of actionable levers. It systemizes, operationalizes and prioritizes the thinking around climate change adaptation by answering for key questions:

- Where and from what is the country most at risk? The most relevant hazard(s) are identified – for example, flooding, drought, wind hazard, or rise in sea level – along with the locations and population segments most vulnerable to those hazards
- What is the magnitude of the potential loss? To deal with uncertainty, we calculate the future economic loss and population at risk for set of climate change scenarios – for example, "today's risk", "average climate change", and "extreme climate change"
- What measures should be considered? The full range of available measures to avert or transfer the loss – spanning infrastructural, technological, behavioral, and financial solutions – are evaluated, and their costs and benefits calculated
- How can those measures be executed? Barriers to implementation are identified and effectively addressed

The loss assessment is central to our approach and serves two purposes: first, it puts an easy to understand and communicate 'price tag' on today's and future climate risk. Secondly, it sets a target against which adaptation measures need to be developed and implemented. The expected loss within the identified at-risk areas is calculated for different climate change scenarios using three sets of input (Exhibit 6):

Exhibit 6

Value at risk approach



- **Hazard:** Frequency and severity scenarios are developed for most relevant hazards
- **Value:** The risk in the area is quantified in terms of population, assets, and income value today and projected out to the future
- **Vulnerability:** The vulnerability of population, assets, and incomes to the hazard is determined by using "vulnerability curves" that define the percentage of value damaged by hazards of different severity for asset classes such as agriculture, residential and industrial/commercial

After quantifying the expected loss per hazard for the different climate change scenarios, the project would re-evaluate potential measures to reduce vulnerability. This would strongly build on the existing adaptation plan and consider and evaluate the full range of available measures, whatever their source. These include three kinds of measure to prevent risk from occurring:

- Infrastructure/asset-based responses: measures that require physical changes to existing assets or building of new assets
- Technological/procedural optimization responses: measures that require adoption or use of a different technology, process, or input
- Systemic/behavioral responses: measures that involve behavioral change or a coordinated systematic response

The comprehensive inventory of "localized" adaptation measures with critical participation from national, international, private, public, and NGO stakeholders will then be analyzed in a cost-benefit logic summarized in an adaptation cost curve (Exhibit 7). Additionally, we will look for synergies and dissynergies between those measures to derive an effective portfolio of measures for each location.

Exhibit 7

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Besides the analytic work delivering the mitigation and adaptation cost curves, the deliverables for the first phase includes:

- A series of workshop with key stakeholders, starting to create alignment
- An inventory of initiatives already completed or underway and gathering of existing information from various institutions
- Formulation of initial developmental strategy implications for each focus area (agriculture & forestry, energy, adaptation)
- Identification of quick-win opportunities to start implementation/scale-up of some first initiatives immediately

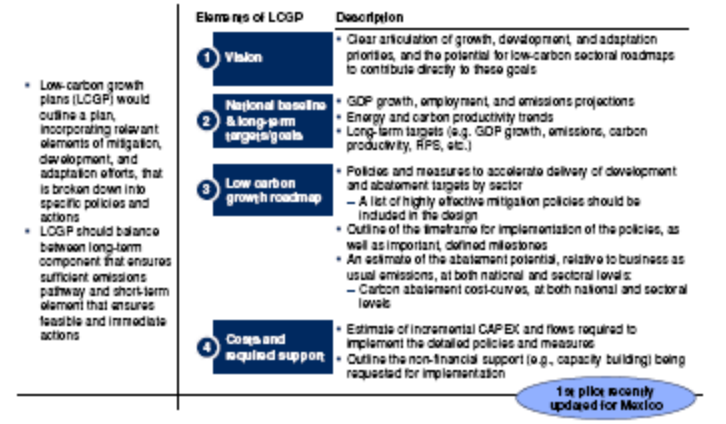
At the end of this stage, we will have a solid foundation, in term of fact and emerging stakeholder alignment, to build the LCGP of Ghana.

Stage 2: Draft LCGP (3 months)

Once the fact base is established, the next step would be to develop the Low Carbon Growth Plan, which implies a four-step process (Exhibit 8). As this approach aims to help Ghana embark on a new development pathway, understanding the vision, baseline, and long-term goals are the critical first steps to defining the aspiration level of the low carbon development strategy. Once this is established, a set of coherent policies and actions, enabling the development of alternative social and economic activities that will be the fabric of the alternative development path need to be identified and their cost assessed.

Exhibit 8

A Low Carbon Growth Plans for forest nations needs to include details how drivers of deforestation will be addressed



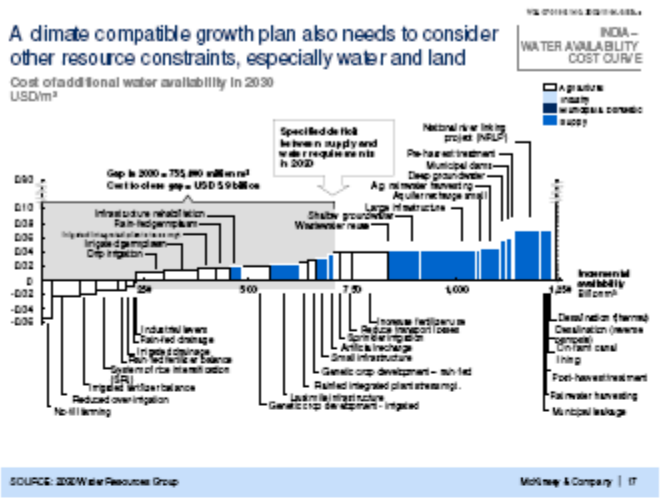
The emerging LCGP would have to contain the following deliverables:

- *Draft mitigation and adaptation strategy* – the different mitigation levers will be organized into coherent programs that will take into account the capability building streams of work and the project implementation programs. As we will draft these strategies, we will also take advantage of the sector workshops to refine cost-curves and adaptation analyses, as well as to identify what will be the candidates for pilot projects, integrating some capacity building critical elements like disbursement approaches (Exhibit 9)

Exhibit 9

- *Micro-economic implications of LCGP* – As implementing the LCGP will cast the country into an alternative growth pathway, it is important to understand its implications in terms of GDP, job creation and other micro-economic indicators. Comparing these indicators for a BAU and low carbon scenario will allow identifying the gaps to be covered in the context of a LCGP
- *Emerging institutional design* – We would also assess the institutional requirements and processes, in particular the role of the existing National Climate Change Committee or the National Climate Change Commission that Ghana plans to establish. Other potential institutional set-ups to support implementation of the LCGP could include installing climate change focused risk officer's position(s) in the relevant government authorities
- *Potential constraints* – The potential hurdles to implementation – technical, resource driven (water example on exhibit 10), financial – will be identified. Some of them can be mitigated with a clear action plan, while the impact of the others will be assessed and integrated into the LCGP

Exhibit 10



SOURCE: 2030 Water Resources Group — McKinsey & Company | 17

The stage 2 overall aims at defining the reference framework in which the different programs for fulfilling the development, mitigation and adaptation objectives will be implemented. To ensure coordination and integration of existing policies and programs as well as ownership of the responsible sectors, this phase will be highly participatory involving stakeholders from all sectors across the economy.

Stage 3: Refine LCGP and prepare for implementation (3 months)

This stage will prepare Ghana to move towards implementation of the LCGP. Besides finalizing the plan, it will develop the final design for the institution, the funding requirement and options to cover it, the set up for the transformation program and the communication strategy.

Sector policies and sector development strategies – We will translates the objectives of the draft LCGP into actionable sector policies and sector development strategies. At the same time, the institutions required to support the implementation and monitoring, reporting and verification of the impact should be defined and established. At this stage, the LCGP will be refined, taking into account a reach out process to a greater set of stakeholders, and after collecting more feedback 'on the ground', where the programs need to be implemented. We will formulate sector action plans in relation to sector priorities and medium term development plan and develop implementation plan to incorporate LCGP into national and sector policies, planning and budgeting processes. We will also determine the monitoring, reporting, and verification mechanisms required and determine implementation plan for these.

Final design of the institutions – At the same time, the final design of the institutions (organization, job description, processes, roles and responsibilities) should be decided. Gaps will be identified and an action plan towards the final shape of the institution defined.

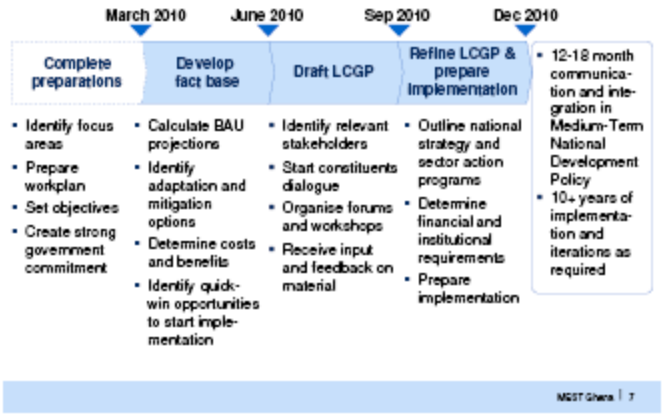
Funding requirement and financing options – With a finalized version of the LCGP, a clear assessment of the *funding requirement* will be made and options for financing will be detailed. A pro forma budget for the major programs will be defined for the years to come.

Transformation program – After the quantification and planning phase, preparing the implementation also means kicking off a significant transformation program is several key sectors for the countries like agriculture and forestry. Driving successfully a transformation requires a strong integrated and coordinated effort between the different programs, a coordination of pilots, resources and institutions. We will leverage our experience setting up these transformation efforts in other countries to define a lean and efficient driving structure in Ghana.

Communication – Communication is part of the transformation effort. We understand that Ghana would like to plan a large scale communication around September (Exhibit 11). At this stage, although the LCGP will still be in process of finalization, we will know enough about it to craft the messages, especially the messages around the benefits for the nation and its population.

Exhibit 11

In 2010 Ghana will develop a national LCGP

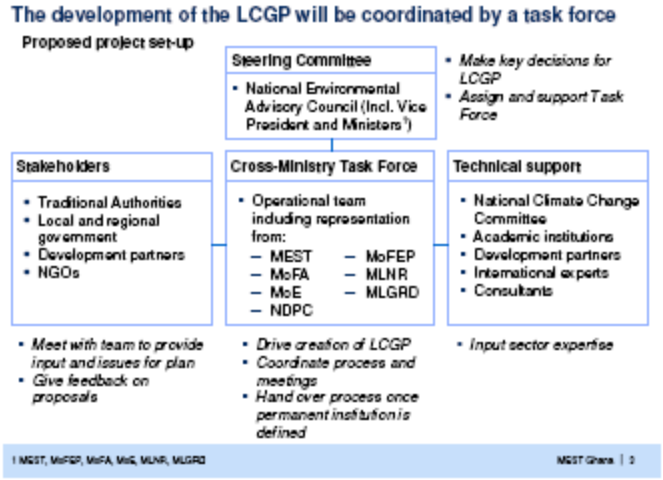


WORKING ARRANGEMENTS

The institutional arrangements for this approach are centered around a full-time cross-ministry task force that would be the operational engine for creating the LCGP. The coordinating ministries of the task for are MEST and MoFEP, with NDPC, MoFA, MoE, MLNR, MLGRD and their related agencies represented on the task force. We would also welcome a representative of the development partners to join the task force. This task force would report to the planned National Environmental Advisory Council under the Vice president (Exhibit 12).

The task force would incorporate technical support from the National Climate Change Committee (including related committees on REDD and on disaster risk reduction), local consultants with relevant experience and of recognized international expertise with demonstrated capability and experience in developing a Low Carbon Growth Plan.

Exhibit 12



Upon completion of the plan, the task force will hand over the planning and policy development process to the appropriate institutional home identified during the exercise. Task force members are expected to lead implementation of the plan in their respective ministries or to work with institutions supporting the plan (e.g. financing, implementation, monitoring, etc).

The expected cost for technical and analytical support as well as the process moderation by McKinsey's senior leadership on climate change and development with a full-time team of a project manager and two dedicated consultants would be USD 830,000 (including all expenses without applicable taxes) for each of the three stages mentioned here above. Before starting stages 2 and 3, we would

suggest to review the scope and time and adapt to the progress. However, in case McKinsey would stop after the first stage, they will need a couple of additional weeks to wrap up the effort in a way that make it documented and ready to hand over to a local team. In this case, the cost of the first stage would increase to USD 1,030,000 (including all expenses without applicable taxes).

Beyond these planning and capacity building phases, additional funding may be required to implement the quick-win initiatives identified by the task force in 2010 as well as to support the longer-term implementation of the low carbon growth plan.

APPENDIX 1 – McKinsey's qualification for this project

We list below McKinsey's technical expertise for this project. In addition, we would like to highlight the following points:

- Beyond deep expertise in REDD economics (see below), McKinsey is among the thought leaders in the key related fields of carbon finance, agricultural productivity, and low-carbon growth plans.
- McKinsey has a global network—both internal and external—that they can mobilize. This covers leading academics and practitioners in the field of LCGP development as well as the main potential contributors to the Fast Start Funding.
- McKinsey will be mobilizing their senior leadership on this effort, and propose to support us with a much higher tenured team than usual. This senior team will bring real-world expertise and direct engagement in the global agenda.
- Given their previous support to the Ministry of Environment McKinsey has the team ready to start from day one. There will be no 'first month' of figuring out how to work together, sorting out who's who, or trying to understand the real (as opposed to the stated) context. The team members are deeply involved in the LCGP debate.

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Through McKinsey's Climate Change Special Initiative (CCSI) they have established an unparalleled depth of knowledge in the field of climate change mitigation economics—with a specific, distinctive base of abatement curves. Since 2006, McKinsey has been working intensively with leading companies and governments across the world to establish a Global Greenhouse Gas (GHG) Abatement fact base. McKinsey CCSI has also developed several proprietary models, among which is a global biomass availability model, which provides a comprehensive picture of the rising demand for biomass and its implications for land-use patterns around the world. They are now complementing work on a land-use model with a major effort on future agriculture productivity and supply/demand balance of agricultural and forest products. In addition to the global perspective, McKinsey has developed more detailed GHG abatement cost curves for 14 countries, including the United States, Germany, China, and Brazil, and is currently developing several more, including e.g., India and Indonesia.

McKinsey's experience in the economics of mitigation, both 'macro' (or top-down) and 'micro' (or bottom-up) is as follows:

- The global GHG abatement cost curve includes a detailed assessment of the economics of forest-based mitigation and of REDD, based on a bottom-up assessment of the opportunity cost of avoided deforestation.
- McKinsey developed a cost curve for Brazil using the assessment of the cost of stopping deforestation in the Amazon using a budgetary approach as a central element.
- McKinsey also supported the Office of the President of Guyana in developing the Economic Value to the Nation (EVN) method to assess the opportunity cost of avoided deforestation in Guyana and elsewhere.
- McKinsey is currently developing the abatement cost curve for Indonesia in collaboration with the Indonesian National Climate Change Council.
- McKinsey supported the development of a strategy for afforestation and avoided deforestation for the Office of the Governor of Parà, Brazil.
- On Behalf of Sir Nicholas Stern, McKinsey is supporting the Africa negotiators in the UNFCCC process by providing a fact base on mitigation and adaptation.
- McKinsey is supporting the Government of Norway along its REDD activities, incl. the IWG IFR and UNFCCC processes

McKinsey is also seen as thought leaders in the area of Climate Adaptation. Together with an international consortium[2], they have pioneered the holistic, end-to-end assessment of the economics of climate adaptation, and the development of a solid fact base to create national adaptation strategies. To test the applicability of our methodology, the country selection deliberately spanned both the developed world – where portions of the analysis required for the effort already existed – and the developing world, where key analytics and data sets needed to be created, for example on physical hazard models, asset and income datasets, and assessments of the vulnerability of infrastructure. Specifically, McKinsey has worked in

- **China:** although China, with its enormous land mass, faces a wide range of climate hazards, we focused on one key risk: drought and its impact on agricultural yield in the northeast of the country – a particular concern given China's priority of achieving food security
- **Guyana:** Guyana is a developing country with a tropical climate, located on the north coast of South America. We focused on the risk posed by

[2] Consortium members include the Global Environment Facility, McKinsey, Swiss Re, Climate Works, Rockefeller Foundation, and Standard Chartered Bank

rain-related flooding to people, assets and income in Georgetown, the country's largest city

- **Maharashtra, India:** we focused on drought risk and its impact on agriculture; the results provided useful insights for India as a whole
- **Mali:** Mali is a semi-arid low income country in northwest Africa. We focused on the risk of climate zone shift – a gradual southward shift of the arid Sahara – and its impact on agriculture
- **Samoa:** as a small island developing state in the Pacific Ocean, Samoa is particularly vulnerable to sea level rise. We focused on the impact of potential sea level rise and tropical cyclones on the dense coastal population
- **Tanzania:** a developing country in East Africa, Tanzania is vulnerable to drought on several fronts. We focused on two specific drought impacts: power production, which relies heavily on hydropower, and public health
- **Hull, UK:** Hull, a medium-sized coastal city at the confluence of two rivers, is exposed to coastal and freshwater flooding, wind storms, and sea-level rise
- **Florida, USA:** we focused on three highly populated counties in south Florida, including Miami, and the risk posed to these urban centres by hurricanes

In addition, McKinsey developed an approach for low carbon growth paths (LCGPs). This approach is codified in a report that will shortly be published. This approach was used in McKinsey's work with the Mexican government, where we developed a full low carbon economic development strategy. McKinsey also has a vibrant Economic Development Practice that supports governments on all continents in their national development and sector strategies.

APPENDIX 2 – Sample actions across ministries

Ministry	Sample action
Communication	- Build awareness on climate change - Present issues and initiatives
Education	- Integrate climate issues into curriculums - Ensure climate preparedness of schools - Effect of climate change on school attendance
Employment and Social Welfare	- Promote jobs in low-carbon sectors and industries - Support training programs
Energy	- Transform power sector with renewable power - Drive energy efficiency programs - Ensure emerging oil sector captures reduction opportunities (e.g., gas flaring)
Environment, Science and Technology	- Evaluate environmental risks and impacts - Support research into high impact sectors - Develop and promote relevant climate friendly technologies
Finance	- Capture international financing flows linked to adaptation and mitigation - Link climate financing to existing public financial management systems, while ensuring adequate fiduciary risk controls for flows at scale
Food and Agriculture	- Promote food security and climate resilience through intensification - Extend sustainable low-carbon practices throughout applicable regions - Plan and coordinate land-use to reduce deforestation and capture reforestation opportunities
Health	- Promote access to health care - Enhance disaster preparedness - Prepare health system to temperature increase (e.g., build cold storage for vaccines, blood, etc.)

Justice and Attorney General	- Ensure regulations across sector (e.g., in forestry) are enforced
Lands and Natural Resources	- Balance demands for resources to account for climate impacts (e.g. REDD)
Local Government and Rural Development	- Engage local governments in developing and implementing initiatives into district development plans
Roads and Highways	- Protect infrastructure from climate impacts
Trade and Industry	- Promote low-carbon products for export
Transport	- Support alternatives to cars including public transport
Water Resources, Works and Housing	- Ensure climate resilience of water supply
Women and Children's Affairs	- Engage women's perspectives in climate change issues

APPENDIX 3 – List of major initiatives currently underway in Ghana

- Natural Resources and Environmental Governance program
- Africa Adaptation Program
- UNDP Annual Workplan
- Disaster Risk Reduction and Climate Risk Management program
- CCAA
- CARE Adaptation Learning Program
- Danish Program with the Water Resource Commission
- World Bank Economics of Adaptation
- Forest Carbon Partnership Facility Readiness Preparation Proposal

APPENDIX 4 – Examples of existing research to be integrated in LCGP

Author	Year	Title
EPA	2010 expected	UNFCCC national submission
NDPC	2010 expected	Medium-term development plan 2010-2013
World bank	2010 expected	Economics of adaptation
NDPC	2009	The implementation of GPRS-II 2006 – 2009
Forestry Commission	2009	Readiness preparation proposal for REDD to the Forest Carbon Partnership Facility
EPA	2009	National adaptation strategy
EPA/UNDP	2009	Sector mitigation strategies
USAID	2009	AgCLIR –Commercial Legal and Institutional Reform in Ghana's Agriculture Sector
EPA	2008	Ghana climate change impacts, vulnerability and adaptation assessments
UNDP	2008	Key issues on land use, land use change and forestry (LULUCF) with an emphasis on developing country perspectives
EPA	2007	Strategic environment assessment of the transport sector
Forestry Commission	2007	The National Forest Plantation Development Program – Annual report
FAO	2005	Global forest resources assessment 2005: Ghana
FAO	2005	Chainsawing in the natural forests of Ghana
EPA	2003	Ghana's climate change technology needs and needs assessment report
EPA	2002	National action program to combat drought and desertification

Appendix 12: Ghana Cocoa-Carbon Initiative (GCCI)

Carbon Project Design Sub Proposal

Presented to Cadbury plc and the Cadbury Cocoa Partnership

From the West Africa Katoomba Ecosystem Services Incubator

24 June 2009

In accordance with recent discussions with Cadbury plc, the Katoomba Ecosystem Services Incubator proposes the following step-wise approach in coordination with the Cadbury Cocoa Partnership to designing a carbon crediting scheme associated with sustainable cocoa production in Ghana. The objective of this 12-month process is to build on Cadbury Cocoa Partnership activities and sites to identify pilot investment opportunities using carbon finance to strengthen improved productivity, sustainability and local livelihoods.

The Katoomba Incubator will work with the CCP and designated delivery partners to screen a set of production practices and sites where these multiple objective have the highest probability of success, and conduct pre-feasibility and feasibility assessments resulting in the development of preliminary design/carbon finance documents for the 2-3 most promising project sites. Results of this initial process will allow Cadbury and CCP to assess the business case for follow-on investment in project design and development to make them fully compliant under international voluntary market certification schemes (or other compliance market opportunities emerging post-Copenhagen) as part of a corporate carbon offset strategy.

1) **Screen the Ghanaian communities where the Cadbury Cocoa Partnership is active to identify approximately six suitable locations for carbon crediting on a pilot scale.**

A screening review to select promising pilot sites will be conducted with CCP delivery partners, COCOBOD and CRIG to identify that combination of sites and project activities where carbon finance may best be able to leverage a shift to sustainable management practices and are representative of broader opportunities that could be scaled up from pilot experience.

Activities and cocoa management practices: Carbon offsets may be generated from a variety of activities related to cocoa farms, suited for varying local circumstances and practices, including both avoided deforestation (REDD) and tree-planting.

Sites would be selected with potential for at least one, and ideally more, of the following forest-carbon activities:

a) *REDD off-farm:* Reducing deforestation threats to natural forest areas, with potential to link to improved on-farm productivity and intensification. Cocoa production areas bordering forest reserves or other natural forests under threat of incursion from cocoa farms.

b) *REDD on-farm:* Reducing the conversion of high-biomass, high-carbon cocoa "forests" to full-sun, low-carbon systems. Cocoa farms at relatively high risk of abandonment or conversion from traditional shaded agroforestry systems to unshaded cocoa production.
c) *Enrichment of cocoa agroforestry systems:* Planting of increased shade, timber and/or fruit trees in cocoa plantations to increase carbon stocks. Areas of cocoa production with relatively low shade tree densities, where farmers might be induced by the prospects of future timber values, carbon crediting, and improved soil quality to plant additional shade trees.
d) *Reforestation:* Areas where farmers have previously abandoned cocoa production, where there are opportunities to re-establish traditional shaded cocoa farming systems or to replant native forest species to increase carbon stores and future timber revenues.

Review with CCP and delivery partners will lead to an assessment of how and where these carbon-maximizing strategies have potential synergies with best cocoa management practices being developed and promoted by the partnership.

Sites: To be drawn from the communities (~100) where the CCP is active, and potentially covering multiple communities if appropriate aggregation mechanisms (cooperatives or other joint production, processing or commercialization institutions) are in place.

The areas selected for pilot carbon project design will likely total between 2000 and 3000 hectares and be representative of conditions and opportunities that could be scaled up and replicated to significantly impact the cocoa sector. Screening would be based inter alia on:

- Within the area of influence of farmer organizations with administrative capacity and strong motivation to facilitate carbon crediting
- Clarity of land ownership/tenure among interested parties
- Strong level of farmer interest in participating
- Location relevant to key cocoa growing zones of the country
- Possibility to go to scale with number of farmers participating in the area (given the major economies of scale in terms of the viability of carbon credits)
- Presence and strength of potential project partners with implementation capacity
- Observable risk factors
- Likelihood of carbon additionality
- Potential to develop multiple carbon offset strategies, with at least one REDD project among the sites
- Accessibility

We expect that this screening process can be done via desk review of CCP communities and via discussions with CCP member organizations, possibly in conjunction with brief site visits.

2) Conduct pre-feasibility assessments of the pilot site candidates to select two or three with a strong business case for carbon-related investment.

Working from the short list of potential project sites, a small team of Incubator staff will conduct site assessments to make an initial determination of carbon project feasibility under existing VCS project classifications for Afforestation, Reforestation, and Revegetation (ARR), Improved Forest Management (IFR), and/or Reduced Emissions from Deforestation and Degradation (REDD).

This will include an estimate of carbon stocks based on existing data for comparable forest type and tree densities, and an initial estimate of carbon sequestration and/or avoided emissions that may be eligible for carbon crediting, preliminary financial and economic assessment (including carbon, cocoa, as well as other potential project revenues such as from timber), a review of local implementation capacity, survey of data availability, appraisal of possible legal constraints, and risk assessment.

3) Detailed feasibility study and preliminary carbon project design

The detailed feasibility assessment will define the parameters of the project and the expected carbon benefits with greater precision. The study result in a detailed Project Idea Note and work plan, laying the groundwork for subsequent development of a Project Design Document (PDD), which is the basis for an eventual sale of carbon credits related to sustainable agroforestry projects in Ghana.

Feasibility and preliminary project design will entail, amongst others:

- *Project baseline and carbon stocks:* Baseline assessments at the site level will be developed in coordination with other project partners such as the University of Reading and Oxford Centre for Tropical Forestry and the, using a combination of available satellite imagery (for REDD project types), biomass growth projections, rapid forest inventory work, and locally available information. For REDD project types, project baselines should be consistent with any emerging national baselines, and to the extent possible, with baselines of other relevant projects. This linkage will be strengthened by integration with the development of a national-level forest carbon map to be developed with Prof. Yadvinder Mahli (Oxford) and Ghanaian colleagues in partnership with Katoomba and NCRC.

- *Modelling project impacts:* For both Forest and On-farm REDD components, we must estimate the reductions in emissions deforestation and forest degradation that can be verifiably attributable to promoting specific sustainable, shade-grown cocoa production methods.

- *Additionality assessment:* Review of project activities' likelihood of satisfying additionality tests (CDM tool) as a condition for carbon finance.

- *Threat Analysis:* For REDD project types, we must establish that cocoa production does in fact lead to deforestation or carbon stock degradation, and precisely how. It is also likely that as we understand the cocoa-related drivers of deforestation, we will identify other drivers that can be addressed simultaneously with cocoa production changes so as to improve the overall economics of the REDD component.

- *Definition of Boundaries*: The location of project boundaries for purposes of carbon accounting and benefit sharing must be based on the location of specific deforestation and degradation threats, the geography of farmer groups, land use rights, and other factors.

- *Accounting methodology selection:* Depending on the sites selected, different carbon accounting methodologies may be required, some of which may require independent validation. For establishment / re-establishment of new cocoa farms, a likely methodological candidate is AR-AMS0004, "Simplified baseline and monitoring methodology for small-scale agroforestry – afforestation and reforestation project activities under the clean development mechanism." REDD activities would draw from methodologies/modules currently under review by VCS.

- *Leakage analysis:* As a sub-national activity, negative project impacts on surrounding areas need to be understood to ensure net positive project impacts. This is accomplished by means of a leakage analysis.

- *Structuring performance incentives:* A benefit sharing structure must be developed in close coordination with CCP delivery partners, with adequate stakeholder involvement to encourage participation, avoid conflict, and lay a foundation for future project development and conflict resolution. This entails outlining possible incentive mechanisms, levels, terms of contracts and agreements, and management structures. Carbon-related payments may be a relatively small portion of the possible benefit streams, and institutional arrangements are likely to involve existing farmer organizations, but they will also likely involve participation by investors, the government, and NGOs.

- *Aggregation mechanisms:* Pilot projects even at small-scale (e.g. hundreds of farmers) will need to involve aggregation mechanisms, ideally building on existing farmer, finance, processing or commercialization platforms. Ideally mechanisms should be identified for pilot site that are replicable and scalable over a significant portion of all cocoa producers in Ghana.

- *Roadmap to market:* Project feasibility and preliminary design will lay advanced groundwork for developing these projects to generate credible carbon offsets satisfying international standards (i.e. VCS and CCB). Outputs at the end of this phase will also include detailed work plans, timelines and budgets for subsequent steps required to get to market (see below).

Phase II: Project Design Documents, Validation and Sale

The preceding activities and outputs will enable Cadbury and the CCP to evaluate the business case for investing in full PDD development and the additional technical work (site-specific baseline modelling, detailed forest inventories for carbon stock measurement) and approval, certification and validation required to bring offsets to market.

The costs of these subsequent stages may vary widely, depending on existing data availability, scale of the project sites, local implementation capacity and type of project activities, but may entail investments on the order of $60,000-$120,000 per project.

Once specific carbon crediting activities are identified and planned for each site, Project Design Documents (PDDs) can be drafted to document the details of carbon accounting, community engagement, and biodiversity benefits. If these documents conform to Voluntary Carbon Standard (VCS) and/or Climate, Community and Biodiversity (CCB) standards, the PDD will then be available for validation by an auditor to obtain VCS and/or CCB certification. Such certification provides assurance to investors, shareholders, and the public about the quality of the carbon credits purchased and the validity of any claim of carbon neutrality or climate impact.

Project Partners

West Africa Katoomba Incubator

In partnership with Nature Conservation Research Centre, the Katoomba Group is developing a regional Incubator hub, based in Ghana, for carbon and other ecosystem service project development in West Africa. The Incubator is currently initiating activities with private, public and not-for-profit clients in Ghana and Liberia, including projects relating to community-managed protected areas, tree crops and sustainable charcoal production. Activities in support of the CCP will be conducted through this local Incubator hub, drawing both on local expertise and international experts as appropriate.

Nature Conservation Research Centre – Nature Conservation Research Centre (NCRC) is recognized internationally as a leader in developing rural ecotourism and community protected areas as a means of economic development and resource conservation. NCRC is partner for the West Africa Incubator, a joint effort with the Katoomba Group, providing early-stage development support to community-based ecosystems services projects, with a strong emphasis on forest carbon.

NCRC's initiatives have facilitated sustainable economic development in scores of poor rural areas of Ghana and other nations in West Africa. Founded in Ghana in 1996, NCRC has grown rapidly to become Ghana's leading indigenous conservation organisation, as well as a key actor in West African civil society. Ghana's National Tourism Policy has adopted NCRC's model as the preferred approach to the development of rural tourism. The model is acknowledged globally as one of the most successful rural tourism initiatives being implemented today. In addition to ecotourism, NCRC's current focus includes climate change and biodiversity conservation, as well as capacity-building and mentoring of peer organisations. The key ingredient of success in these projects is the philosophy that conservation will only be successful in settings where the affected local communities obtain tangible economic returns

and cultural incentives for its implementation. As NCRC's work has continued to evolve in Ghana, it is also collaborating on projects in Nigeria, Mali, Cote d'Ivoire and Liberia and is discussing new involvements in Sierra Leone and Senegal.

Integration with other Katoomba Group activities in West Africa

The process of Cocoa-Carbon project screening and feasibility assessment fits well within a series of concurrent activities in various stages of planning and development, for which the Katoomba Incubator will mobilize complementary capacity and finance. These include:

Carbon Project Scoping Workshop, 2-3 July, Accra, Ghana

Forest Trends is developing a tool for classifying and prioritising potential REDD and other forest carbon projects, which will contribute to the Incubator, Cadbury, Government of Ghana's understanding of how these project activities fit into and contribute to a national REDD+ strategy.

This tool can be applied before embarking on the costly process of pre-feasibility and feasibility analysis leading to a project design document (PDD). The tool involves a 'Project Type Analysis' that considers the carbon market potential of different generic project types in Ghana. As part of the Incubator Scoping Study, we will hold an 'Information Gathering Exercise' involving a small group of key informants or 'expert team', to be held in Accra on Thursday and Friday 2nd and 3rd July.

The aim of this Incubator Scoping study is to promote a systematic REDD project selection process that enables Ghana to develop a balanced and strong portfolio of projects that responds to strategic priorities, and in which the likelihood of project success is maximised from an early stage. A second aim is to identify key legal, policy and institutional gaps in the development of viable carbon credits; this analysis will feed into national level discussions of how to develop a facilitating policy framework for REDD (and other types of carbon finance). A third is to promote national capacity in the assessment of potential REDD projects.

It is expected that this exercise can make a significant contribution to national REDD strategy development, and should complement the World Bank Forest Carbon Partnership Facility Readiness Plan (R-Plan) process. This exercise would be undertaken in close coordination with the National REDD Steering Committee, and is being funded by the USAID and Moore Foundation.

Carbon Project Development Clinic, 1-3 September, Accra, Ghana

The Incubator project clinic will offer an opportunity for about a half dozen NGOs and project developers in Ghana and Liberia to learn about the carbon project development process, and to work intensively with successful forest carbon project experts from tropical areas around the world. Topics to be covered will include

- Land-use and climate change fundamentals,

- Measuring and monitoring carbon stocks,
- Carbon accounting methodologies,
- Avoided deforestation strategies,
- Legal and institutional matters,
- Market and financial considerations, and
- Measuring and monitoring social and environmental impacts.

One or more promising sites from the CCP would ideally participate in this clinic.

Katoomba Group Meeting XV, 4-6 October, Accra, Ghana

Katoomba events are strategically designed to bring together key market actors from the public, private, and non-profit sectors to share information and partner on opportunities relating to ecosystem services transactions. The 15th of these international events will be held in Ghana in early October, with a strong focus on forest carbon, particularly as these relate to tree crops (e.g. cocoa) and REDD. Bringing together global best practice and experience this Katoomba event will aim to contribute to regional capacity to engage in sub-national, national, and international payments for ecosystem services. We would like to invite Cadbury plc to be one of the sponsors of this event, which has confirmed support from the World Bank, the Gordon and Betty Moore Foundation, the US Agency for International Development (USAID), and others.

The Katoomba Group meeting will feature discussions led by world experts to explore the potential and challenges of PES mechanisms in West Africa, including the following topics:

- Progress and challenges for national REDD Programmes, including methodological, policy, and social issues
- How to achieve "pro-poor REDD", including issues around benefit-sharing mechanisms and carbon property rights
- Tree crops and carbon, including the potential to promote sustainable agroforestry systems
- Consideration of wider 'terrestrial carbon' options, including the potential of "soil carbon" to support sustainable agriculture and poverty reduction goals, as in the African BioCarbon Initiative.
- Biodiversity offsets from industrial natural resource extraction, as well as other potential biodiversity schemes
- Assessing the potential for PES mechanisms to compensate marine and coastal ecosystem services, including analysis of issues around off-shore oil exploration
- Opportunities for measuring and compensating the hydrological benefits of forests, and analysis of the PES potential of mangroves and wetlands

Although there have been three Katoomba Group meetings in Africa - Uganda (2005), South Africa (2006) and Tanzania (2008) - this will be the first in West Africa. It is timely in that PES interest in the region is fast increasing; for example, Ghana, Liberia and Cameroon have been approved funding by the World Bank's Forest Carbon Partnership Facility (FCPF) for developing Reduced Emissions from

Deforestation and forest Degradation (REDD) Readiness Plans, and there are several emerging private sector initiatives to develop 'forest carbon' credits. These early developments are encouraging, but there is an enormous need for information and capacity building in order to effectively access these new markets.

Budget

	Screening	Prefeasibility (6 sites)	Feasibility (3 sites)	Sponsorship Katoomba event	TOTAL
Staff and consultants	$ 10,500	$ 54,000	$ 95,000		$ 159,500
Travel and meetings	$ 4,000	$ 9,200	$ 10,000	$ 50,000	$ 73,200
Mapping, imagery and rapid field inventory		$ 20,000	$ 35,000		$ 55,000
Operating costs and communications	$ 650	$ 3,500	$ 8,000		$ 12,150
Contingency (5%)	$ 725	$ 4,160	$ 7,000		$ 11,885
OH (15%)	$ 2,381	$ 13,629	$ 23,250		$ 39,260
Total	$ 18,256	$ 104,489	$ 178,250	$ 50,000	$ 350,995

The Assessment team

Michael Jenkins is the Founding President of Forest Trends. He has three decades of experience working with development organizations, financial institutions, scientific experts, project developers, and community groups around the world to develop markets and payments for ecosystem services, including carbon sequestration. He has published numerous books and articles and convened meetings around the world to inform, connect, and mobilize stakeholders from different communities toward the common aim of market-based ecosystem conservation. Prior to founding Forest Trends, Michael worked as a Senior Forestry Advisor to the World Bank; the Associate Director for the Global Security and Sustainability Program at the MacArthur Foundation; an agroforester in Haiti with USAID; technical advisor to Appropriate Technology International; and served as a Peace Corps volunteer in Paraguay.

John Mason is Executive Director of the Nature Conservation Research Centre (NCRC) in Accra, Ghana. Mr. Mason has been based in Ghana for 25 years and is regarded as one of the leading voices for community participation in conservation initiatives within West Africa. He has worked with communities, governments and civil society in Ghana, Nigeria and Liberia to develop conservation initiatives that are owned and managed by indigenous people. He is a member of the IUCN African Elephant Specialist Group and regularly provides expert advice to various international development

organizations. Mr. Mason holds various degrees from the Northern Alberta Institute of Technology, University of Waterloo and University of Guelph in Canada.

Joseph Osei is a Natural Resources Manager with specialisation in forestry as well as rich technical, management, consultancy and research experience gained with the Soil Research Institute of Ghana, the Forest Services Division (FSD) Ghana, Subri Industrial Plantation Limited in Ghana and many institutions in Ghana and abroad. Mr. Osei is a practicing Forest Management/Forest Carbon and Chain of Custody Certification Lead Auditor of the SmartWood programme of the Rainforest Alliance. He holds and MBA from the Paris Graduate School of Management and a Masters of Science in Tropical Forestry from the University of Science and Technology of Kumasi, Ghana.

Senior Forest Carbon Technical Specialist, Katoomba Incubator. The Incubator is also in the process of hiring a full-time staff member with technical expertise in forest carbon project development.

David Tepper brings expert carbon finance analysis and advice from over 20 years experience as an investor and corporate manager with a variety of firms in the US and Europe, including Merrill Lynch, Kataweb, Cosodata, Acxiom, and Climate Change Capital. Specializing in private sector solutions to environmentally sustainable land use, Mr. Tepper has been a pioneer of the voluntary carbon offset market, developing sustainable forestry funds, carbon finance investments and eco-tourism projects. David holds a biology degree from the University of North Carolina, Chapel Hill.

Jacob Olander of EcoDecisión, manages the Ecosystem Services Incubator Katoomba Group. Mr. Olander's background includes work with non-timber forest products, conservation of private lands and indigenous territories, and incentive-based conservation agreements in Latin America. He has been active in the field of climate change policy and projects since 1997. He has consulted extensively for international organizations such as The Nature Conservancy, Conservation International, WWF, UNDP, and the Inter-American Development Bank. Jacob has a B.A. in Development Studies from Brown University and a Master's in International Agriculture and Rural Development from Cornell University.

Michael Richards, Ph.D. is a Natural Resources Economist with 30 years development experience, with particular emphasis on payments for ecosystem services, community-based forest management, policy and institutional analysis, and agriculture/rural development. This includes 8 years as an Overseas Development Institute Research (ODI) Fellow. His qualifications are from the Universities of Cambridge, London and Glamorgan. He has extensive experience in Ghana over the past 17 years, including as team leader of a one year ITTO study of incentives for high forest management; a DFID/ODI research study on incentives for cocoa farmers to retain shade trees; and an impact assessment of Ghana's Voluntary Partnership Agreement with the EU. He is also currently a consultant advising on the development of Ghana's REDD Readiness Plan.

Phil Covell is a Business Analyst for the Katoomba Group Ecosystem Services Incubator, managing a portfolio of carbon projects related to agriculture and agroforestry. Mr. Covell was a founding manager of Triodos PV Partners, where he provided debt, equity, and business management support to renewable energy enterprises in 23 countries of Africa, Asia, and Latin America. Prior to that he developed markets for photovoltaic technology in Latin America through the Global Transition Group as

Executive Director of Enersol Associates, Inc. and CFO of Soluz, Inc. Mr. Covell is a graduate of the School for International Training, and holds an MBA from the University of California, Davis.

Incubator Consultants. The Incubator draws on a range of consultants with successful experience in the design and implementation of forest carbon projects, including Yadvinder Malhi, Lucio Pedroni, Mariano Cenamo, and others.

Appendix 13: Overview of CDM to date and CDM project pipeline in Uganda

Table 1: Overview of projects

Status of projects	**CDM projects**
Registered	2
Request for review and correction	0
Validation	10
Rejected	0

Table 2: CDM project pipeline (http://cdmpipeline.org, 2010)

ID	**Title**	**Status**	**Type**	**Methodology**	**2012 ktCO2e (ktons of carbon dioxide equivalent)**	**2020 ktCO2e (ktons of carbon dioxide equivalent)**
CDM0361	West Nile Electrification Project (WNEP)	Registered	Hydro	AMS-I.D.+AMS-II.B.	290	580
CDM1648	Uganda Nile Basin Reforestation Project No.3	Registered	Reforestation	AR-AMS1[4]	30	67
CDM3197	Kakira Sugar Works (1985) Ltd. (KSW) Cogeneration Project	At validation	Biomass Energy	ACM6+ACM2[5]	248	681

[4] AR-AMS1 = Afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands

[5] ACM2 = Grid-connected electricity generation for renewable sources (no biomass)

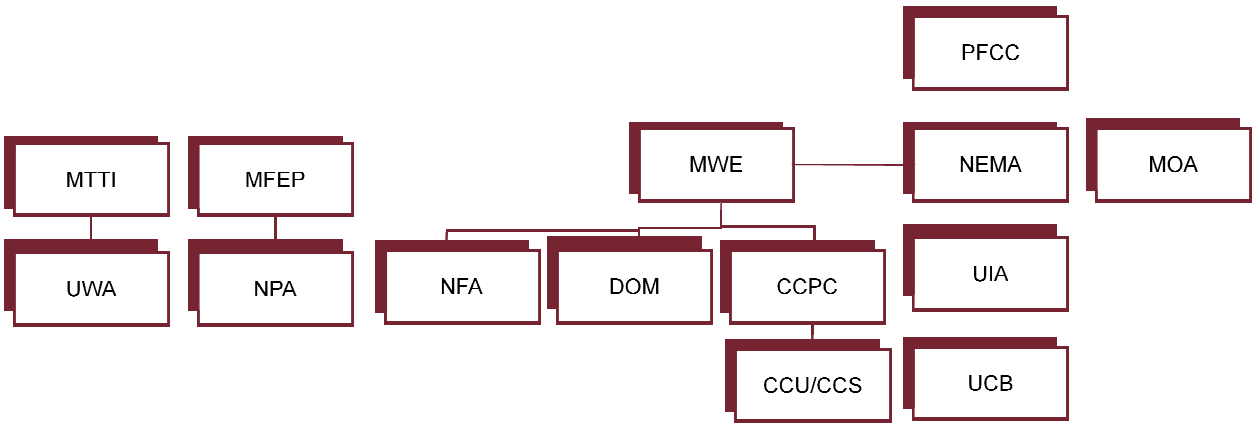
CDM4125	Bugoye 13.0 MW run-of-river Hydropower project	At validation	Hydro	AMS-I.D.	177	543
CDM4392	Uganda Nile Basin Reforestation Project No 1	At validation	Reforestation	AR-AMS1	28	88
CDM4431	Uganda Nile Basin Reforestation Project No 4	At validation	Reforestation	AR-AMS1	26	71
CDM4434	Uganda Nile Basin Reforestation Project No 2	At validation	Reforestation	AR-AMS1	16	64
CDM4435	Uganda Nile Basin Reforestation Project No 5	At validation	Reforestation	AR-AMS1	53	100
CDM4817	Bagasse Cogeneration Project Kinyara Sugar Limited (KSL)	At validation	Biomass Energy	ACM6[6]	308	801
CDM4956	Mpererwe Landfill Gas Project	At validation	Landfill gas	AMS-III.G.	55	153
CDM5500	Ishasha 6.6 MW Small Hydropower project	At validation	Hydro	AMS-I.D.	57	208
CDM6102	Buseruka	At	Hydro	AMS-I.D.	85	329

[6] ACM6 = Grid-connected electricity from biomass residues (includes AM4 & AM15)

	Mini Hydro Power Plant	validation				

Appendix 14: Institutional Capacity in Uganda

Institutional org chart outlining government level entities involved in climate change policy and carbon markets in Uganda



MTTI: Ministry of Tourism, Trade & Industry
UWA: Uganda Wildlife Authority
MFEP: Ministry of Finance & Economic Planning
NPA: National Planning Authority
MWE: Ministry of Water & Environment
NFA: National Forestry Authority
DOM: Department of Meteorology
CCPC: Climate Change Policy Committee
CCU: Climate Change Unit
CCS: Climate Change Secretariat

PFCC: Parliamentary Forum on Climate Change
NEMA: National Environment Management Association
UIA: Uganda Investment Authority
UCB: Uganda Carbon Bureau
MOA: Ministry of Agriculture

Appendix 15: CTI PFAN AFRICEF – Call for Proposals for Business Plan Competition

CTI PFAN
CTI PRIVATE FINANCING ADVISORY NETWORK

connecting clean energy businesses with financing

CTI PFAN AFRICEF Call for Proposals for Business Plan Competition

The CTI PFAN Africa Forum for Clean Energy Financing, to be held in Johannesburg, South Africa on 21st July 2010, will showcase high-quality clean energy projects from around the African region in front of some of Africa's leading investors. The Forum seeks proposals from clean energy entrepreneurs and businesses that are financial viable, socially responsible and environmentally beneficial.

The Forum is being sponsored by the Climate Technology Initiative (CTI), CTI's Private Financing Advisory Network (CTI PFAN), the U.S. Agency for International Development (USAID) and the Renewable Energy & Energy Efficiency Partnership (REEEP) with support from the International Center for Environmental Technology Transfer (ICETT). Co-Organisers include the Rural Electrification Agency of Uganda (REA) as well South African National Energy Research Institute (SANERI). PPL International is managing the Forum on behalf of the Sponsors and Co-organisers.

The highest-quality projects will be presented at the Forum to potential investors and financiers. Developers of the selected projects will receive one-on-one coaching and mentoring from CTI PFAN. The Forum will be conducted in a competition style and awards will be presented to those proposals with high business potential.

Eligibility

Any persons or company resident or actively operating and/or registered in any African country may participate in the CTI PFAN Africa Forum for Clean Energy Financing. While there is no restriction on the size of the company / sponsor, the award is designed to reflect excellence in new ventures.

Focus of Business that will be considered

The business must promote clean energy technologies, products or services that would in general include:

- Biomass
- Biogas
- Solar
- Wind
- Geothermal
- Hydropower
- Clean Transport
- Tidal / Ocean
- Rural Electrification
- Distributed & off-grid generation
- Waste-to-energy
- Emission reduction
- Energy efficiency & storage
- Forestry

Competition Categories

Only business opportunities that require total (initial) capital in excess of US$1 million (or currency equivalent) will be considered.

Acceptable Business Proposals

Projects eligible for the Forum may include, but are not limited to:

- New venture / new business including green-field utility type projects
- Downstream projects, deploying existing clean technologies
- Upstream projects for the development of new clean technologies
- Merger or acquisitions, which will lead to increased value
- Joint-venture, alliance or network-based business (e.g., create new entity from current enterprises)

Submission of Application

The submission of the Application to Participate together with an Executive Summary and the Project Data Sheet must be made by midnight Friday 16th April 2010 to *kuroda@icett.or.jp*.

The highest-quality projects will be selected as potential finalists and semi-finalists in the competition at the Forum. Less mature projects will be selected for ongoing mentoring and potential inclusion in subsequent forums. A third category – upstream technology development projects – will be considered for inclusion into the new technology development stream of PFAN in 2010 and beyond.

The Application Form, Project Data Sheet and Executive

Summary Guidelines can be downloaded from the cti-pfan website (*http://www.cti-pfan.net*). Participants selected to advance into the next round will be notified by 23rd April 2010.

Timeline

Stage 1: Application and Executive Summary Submission
The submission of the Application to Participate together with the Executive Summary and Project Data Sheet must be made by 16th April 2010 to *kuroda@icett.or.jp*. Application Form, Project Data Sheet & Executive Summary Guidelines can be downloaded from the website (*http://www.cti-pfan.net*).

Stage 2: Coaching and Business Plan Preparation
Teams selected to advance into stage 2 will be offered one-on-one coaching. In this stage, CTI PFAN consultants selected based on the scope of the respective business plan will assist the teams in preparing a concrete business plan. This support, up to five days in total, will be provided at no cost to the teams. Additionally project development & financing workshops (*details of which shall be determined in due course*) will be held for all selected participants to provide expert input and advice in a group environment.

Stage 3: CTI PFAN Asia Forum for Clean Energy Financing
Based on the business plans and recommendations by the CTI PFAN consultants, up to 9 finalist teams and a number of semi-finalist teams will be selected to attend the CTI PFAN Africa Forum for Clean Energy Financing in Johannesburg, including a final preparatory workshop on the day before the Forum. At the Forum, up to 9 finalist teams will present their business plans to investors and a judging panel. This will include an expense paid trip to the Forum site including accommodation and travel cost.

Sponsors

Climate Technology Initiative. The CTI is a multilateral initiative that operates through an Implementing Agreement under the International Energy Agency (IEA). Its mission is to bring together stakeholders from the public and private sectors to foster international cooperation in the accelerated development and diffusion of climate-friendly and environmentally sound technologies and practices. The CTI Member countries are: Australia, Austria, Canada, Finland, Germany, Japan, Norway, Republic of Korea, Sweden, UK and USA.

USAID. The U.S. Agency for International Development promotes long-term and equitable economic growth by supporting economic growth, agriculture and trade, including sustainable energy initiatives; global health; and democracy, conflict prevention and humanitarian assistance. USAID supports CTI PFAN through its Bureau for Economic Growth Agriculture and Trade (EGAT) in Washington, DC, as well as its Regional Development Mission for Asia (RDMA) based in Bangkok, Thailand

REEEP. The Renewable Energy & Energy Efficiency Partnership is an international multi-stakeholder partnership which aims to accelerate the market for renewable energy and energy efficiency in emerging markets and developing countries. REEEP initiates and funds projects with targeted interventions in two specific areas that offer the greatest potential for developing the market for sustainable energy: assisting governments in creating favorable regulatory and policy frameworks and promoting innovative finance and business models to activate the private sector. REEEP provides funding support for CTI PFAN activities in Mozambique and Ugandia.

Co-Organizers

Rural Electrification Agency. REA was established as a semi-autonomous Agency by the Minister of Energy and Mineral Development through Statutory Instrument 2001 no. 75, to operationalise the Government of Uganda's rural electrification function under a public-private partnership. It functions as the secretariat of the Rural Electrification Board (REB) which carries out the Minister's rural electrification responsibilities, as defined in the Electricity Act of 1999. The Rural Electrification Agency (REA) is mandated to facilitate the Government's goal of achieving a rural electrification rate of at-least 10% by the year 2012 from 1% at the beginning of the decade.

South Africa's National Energy Research Institute. SANERI is the public entity entrusted with the coordination and undertaking of public interest energy research, development and demonstration. SANERI is a relatively new body, established by the Minister of Minerals and Energy in October 2004, as a subsidiary of CEF (Pty) Ltd, the state energy company in South Africa. The Department of Science and Technology, together with the Department of Minerals and Energy, are joint custodians of SANERI and assist in providing political and strategic focus for the company.

About CTI PFAN

The Private Financing Advisory Network (CTI PFAN) is a multilateral, public-private partnership initiated by the Climate Technology Initiative (CTI) in cooperation with the UNFCCC Expert Group on Technology Transfer. PFAN was established to bridge the gap that exists between investors and financiers on the one hand, and entrepreneurs and project developers on the other. PFAN targets clean energy projects that may be suitable for private-sector finance at an early stage and then acts as a project financing coaching and consultancy service to guide such projects to bankability and financial closure. For more information, go to *www.cti-pfan.net*

For detailed information, please visit our website at
www.cti-pfan.net