

Carbon finance in africa and strategies employed by google

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Carbon Trading: Strategies employed byGoogleInc.

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09002015 Abstract The market for trading allowances relating to the right to emit carbon dioxide or the Emissions Trading Market has expanded dramatically in the last few years and promises to continue to do so in the near future. It has an extremely high profile as it is intrinsically linked to worldwide efforts to address climate change.

The key differences between the emissions market and the commodities markets are that it is a politically-generated and managed market and that the underlying is a dematerialized allowance certificate, as opposed to a physical commodity. Global warming is a high priority topic in any political index across the globe. Considerable efforts are being made in this direction, some of which include UN Framework Convention on Climate Change (UNFCCC) - 1992, the Kyoto Protocol - 1997 and the Bonn Agreement - 2001. The New Oxford American Dictionary even chose ' carbon neutral' as word of the year for 2006.

Many liken the practice of buying carbon credits to buying pardons from the Catholic Church in 16th century Europe. We believe that it is easier to assess our progress and achieve our goals if we attach a value to something. It was found that economists too think the same and they jumped at the opportunity to attach a monetary value to the environment issue at hand. The paper attempts to advise these nations so that they may design an

innovative mechanism which enables them to benefit from their carbon offset potential and not just rely on the good will of other nations.

The paper does a Case Study on Africa and its huge potential to take the initiative in designing such a market.

Introduction Tradable carbon units are one of the most effective instruments in the battle for a better environment. What is a carbon unit you ask? A carbon unit is a permit to emit one tone of carbon dioxide (CO₂). I. The Emission Trading Scheme (ETS) 169 industrialized nations agreed to reduce greenhouse gas emissions to a level of 5. 4% by 2012 keeping 1990 as the base. Thus, the Kyoto Protocol gave birth to the carbon trading market.

The UN distributes carbon units to those industrialized countries who have signed the treaty, who set a limit on the level of emissions. This limit is equivalent to the total amount of emissions that they are allowed to emit. Countries may buy and sell units. The price of tradable units will be determined by the volume of units in circulation, similar to a stock exchange. II. Kyoto Protocol's flexibility mechanism When a country to unable to reduce its emissions to the cap set by the Protocol, the market dynamics of ' cap and trade' come into play.

The Kyoto protocol allows for reduction projects to be carried out in other countries. The Protocol assumes that emissions of greenhouse gases contribute equally to global warming wherever they are emitted, meaning that companies can choose to reduce emissions where it is cheapest for them. When projects are carried out in countries without Kyoto target (non-Annex I or developing countries) they operate under the ' Clean

Development Mechanism' or CDM. When they are carried out in countries with a target (Annex I countries), they operate under a process known as 'Joint Implementation' or JI.

The ETS is based on units which must be obtained to cover emissions.

They can be bought or sold. The CDM and JI are project based mechanisms and are together known as 'carbon offsets'. CDMs generate Certified Emission Reductions or CERs which can be used to achieve regulatory platforms or be traded on the international carbon market using the ETS.

With the most recent data released in February 2012, the CDM project share of China, India, Brazil, and Mexico combined has dropped to 65 per cent ([http://www.cdmpipeline.](http://www.cdmpipeline.org/)

org/).

CDM accounted for 91% of the total transacted value which stood at US\$8.2 billion in 2007. III. Market Benefits This is best illustrated through an example.

Let us say that we have a power generator for an electric utility company in France. Further assume that it reaches its Kyoto cap by the end of May. The utility company is contractually bound to deliver electricity for the rest of the year but they have used all their pollution rights. They can now consider their options. a. Do nothing and pay 80\$/tonne CO₂ as tax at the end of the compliance period.

b.

Emissions trading/JI - costs 30\$/tonne c. CDM - costs 20\$/tonne The obvious choice financially would be option c. However, because the ease of transaction is much higher for option b, most power generators currently pay the accompanying higher marginal cost. IV. Types of Projects Carbon offset projects fall roughly into 5 categories- a.

Renewable energy projects - solar and wind energy and biodigesters that utilize methane emissions from manure, agricultural waste, or landfills to generate electricity-reduce emissions by displacing or replacing fossil-fired energy sources. . Energy efficiency projects - low-energy housing and lighting or efficiency gains in industrial processes, reduce emissions by using less energy to accomplish the same tasks. c. Greenhouse gas capture projects - capture non-CO2 greenhouse gases from industrial processes (e. g.

, HFCs) or methane from agriculture or landfills. d. Biosequestration projects - enhance the biological uptake of CO2 through forest planting and protection and through land management practices such as no-till agriculture. e.

Geosequestration - capturing CO2 emitted from coal-fired power plants and other industrial sources and injecting it into old oil fields, beneath the sea bed, or into other geologic structures. V.

Company Strategy Study - Google Google reduces their carbon footprint through efficiency improvements, generating on-site solar power and purchasing green power. To bring their remaining footprint to zero, they buy

carbon offsets. Purchasing carbon offsets means investing in green projects that have very little to do with their core business.

When they purchase a carbon offset, they rely heavily on research, collaboration, standards and due diligence to guarantee they're getting a quality offset that provides long-term global benefit. Here's a hypothetical example: Say there is a Google data center in an area with little renewable power.

First, they reduce their data center electricity usage through energy efficiency improvements. They then talk to the local power utility about purchasing more green power.

Unfortunately, they discover that there aren't additional green energy sources close to our data center, nor are there plans to build more in the near future. Until they can power their operations entirely with renewables or reduce their emissions in other ways, they can use the offsets to fund projects that reduce greenhouse gas emissions, indirectly reducing their total carbon footprint. For example, close to their data center, they discover a large farm that produces a lot of animal waste. Livestock waste produces methane — a particularly potent greenhouse gas that's more than 20 times as harmful as carbon dioxide.

Google invests in a project that allows the farm to collect this waste and process the methane out of it, and they credit Google, their fiscal sponsor, with reducing global greenhouse gas emissions. When Google applies that credit to their carbon footprint, it offsets their emissions from using nonrenewable energy. Google might not know much about manure, and farm
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operators might not know much about search engines, but through this collaboration they reduce global greenhouse gas emissions and contribute to the communities in which they operate. VI. Project Standards for Google

Carbon offset producers have an incentive to pitch planned business improvements as carbon reduction projects to attract outside investment dollars and conserve their own capital. For example, if the farm in the previous example already had plans to build a methane-capture system because it made financial sense or was required by law, giving them additional money through carbon offsets would not create any additional benefits for the environment.

Since Google's goal is to offset their carbon emissions, they only support projects that would not come into being without their investment.

When Google first purchased carbon offsets in 2007, they were aware of the difficulties in buying an effective offset. To counter the information asymmetry between Google and carbon offset producers, they do rigorous research to make sure they are buying only quality offsets, based on four standards: additionality, leakage prevention, permanence and verifiability. Additionality Google's first priority when examining a carbon offset project is proving that it provides additionality— meaning that the proposed project reduces greenhouse gas emissions that would not be reduced through other incentives.

Google works to guarantee additionality by examining past financial information on the project, project details, potential carbon reductions and similar projects in development.

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They also talk directly to project owners and operators. The goal of these assessments is to determine if the investment would lead to a carbon reduction that would not otherwise happen. Leakage prevention An additional criteria is leakage. A reduction of greenhouse gas emissions through one project might simply shift, or leak, to another location or activity.

To prevent leakage, google closely examine the community and environment in which the project is going to take place. Identifying project risks and key stakeholders are the primary components in determining potential leakage.

Leakage typically occurs in situations where resources are being protected. For example, if a carbon offset program focuses on protecting a forest from being logged, it's entirely possible that loggers might move their operations down the road to another forest.

Ensuring that reductions are more global—and not just local—is critical to preventing leakage. Permanence Tied into leakage prevention is the standard of permanence. Greenhouse gases prevented from entering the atmosphere should be stopped permanently.

They have to be certain that the projects they invest in are not temporary methods of carbon reduction or greenhouse gas sequestration. This is typically a concern with forestry projects or anything where greenhouse gases are being stored for a period of time.

If there is significant risk that the stored carbon would be released through events such as a forest fire or a leak from sequestered carbon, the project

would need to account for this, such as through insurance or a buffer of additional reductions. Verifiability The last requirement is verifiability. An objective third party—someone other than the project developer and Google—must be able to look at project data and confirm that the carbon reductions are real and credible.

The third-party verifier determines the proper baseline for greenhouse gas reductions and verifies that the reductions adhere to strict monitoring and reporting standards.

VII. Types of Carbon Offset Projects A number of different project types qualify for carbon offsets, and more are becoming available as new technologies for reducing greenhouse gases are developed. The kinds of projects Google considers for carbon offsets include: Landfill gas capture Decomposing waste creates methane gas, which is a potent greenhouse gas. Small and medium- sized landfills in many U.

S. states are not required to capture or process methane, and thus the methane vents freely into the atmosphere. Capturing and destroying this gas reduces the total emissions of greenhouse gases.

Captured methane can be burned to generate electricity or heat; or after treatment, it can also be injected into the nearby natural gas grid or used locally as compressed natural gas (CNG) for vehicles and other uses. When other options to use the gas aren't available—such as due to the small volume of gas created or the project's remote location—the gas might instead be burned in a flare. It might sound counterintuitive that burning

something reduces carbon emissions, but when methane is burned it converts into carbon dioxide and water.

Carbon dioxide is a less potent greenhouse gas than the original methane, effectively reducing greenhouse gas emissions. Currently, the bulk of Google's carbon offsets come from investment in landfill gas projects. Agricultural methane capture Similar to landfill gas, agricultural methane is produced at farms from decomposing animal waste. Carbon offset projects are designed to collect this waste and process it into usable products, including energy and heat. One method involves collecting manure into a huge, circulating tank called a " digester. The digester promotes bacterial growth, which breaks down the waste into usable organic fertilizer and methane.

The methane is then captured and used or burned. Forestry projects A large amount of carbon is stored in forests. As forests grow, they absorb and sequester additional carbon. However, as forests are logged, degraded or burned, carbon is released. There are various kinds of forestry projects offering carbon offsets, but the concept is either to protect forests from destruction and degradation or to enhance and develop new ones.

VIII. Procurement and due diligence

Carbon offset projects are verified by thirdparty investigators using published public standards. Once a project is verified as creating a credible reduction in greenhouse gases, a carbon registry issues a carbon credit for each metric ton of carbon dioxide (or equivalent) reduced. Google takes a hands-on approach to pursuing offset projects to ensure that they're getting <https://assignbuster.com/carbon-finance-in-africa-and-strategies-employed-by-google/>

the highest quality offsets available. They source projects in a variety of ways, including requesting proposals from project developers and working directly with project owners, marketers and brokers.

While they rely heavily on third-party standards, if they find projects that they believe meet their criteria where no standard exists, they may pursue them and develop a new standard. When they invest in a carbon offset project, they perform due diligence by: 1. Reviewing the documentation from the offset seller and from third-party sources, including reviewing emissions data, permits and site testing results. 2. Visiting the project site and meeting people in charge of day-to-day operations. 3.

Reviewing the verification reports, if a project has already been verified.

Only when they are confident of the operation's quality and have confirmed that the project meets their standards do they purchase the carbon credits associated with the project. For example, in 2010, Google decided to purchase the offsets associated with the Berkeley County landfill gas project in South Carolina. This project involved collecting methane gas from a landfill and using the gas to generate electricity. A local electric utility, Santee Cooper, would purchase the methane from the site to fuel a nearby power plant.

With revenue from gas sales, Google had to carefully review the project's financials in order to verify additionality. They took into account the costs to install the methane capture system versus the estimated revenue from the sale of landfill gas. They had to answer the following question: If there wasn't revenue from the sale of carbon offsets, would the revenue incentive from

the sale of landfill gas to generate electricity be enough for the landfill to install the system anyway? When they calculated the financial rate of return, they compared two sets of financials: One with carbon offset revenue and one without.

In the case of Berkeley County, the project wasn't financially viable for the landfill based on the natural gas revenue alone—gas prices would have needed to be much higher to make the project financially feasible. Thus, the project passed our criteria for additionality, and they invested in it. IX.

Applying carbon credits to Google's footprint Once carbon credits from a project are verified by a third party and issued by a carbon registry, ownership of the credits is transferred from the project owner to Google. The carbon credits are then permanently retired and applied to their carbon footprint.

When they retire a credit, the serial numbers of the credits are located in the carbon credit registry that created them and permanently designated as retired. At the end of this long process—finding and reviewing projects, verifying the emission reductions, contracting for the offsets, taking delivery of carbon credits, and then retiring the credits—they finally apply the credits to their own carbon footprint. Until retirement, the metric tons of greenhouse gases reduced from the carbon offset project are an estimate.

Once they have an exact figure from the carbon credit registry, they apply those metric tons to their footprint. Given the uncertainty of estimating the exact number of metric tons from each project, it is difficult to apply a strict rule of offsetting their footprint year with the year the offset was created.

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Instead, they currently apply a window of up to three years between the footprint year and the year the reduction occurs. Considering that the global warming potential of these gases is calculated over one hundred years or more, the difference in three years is quite small.

In addition to improving their efficiency and investing in green power, they will continue to purchase carbon offsets to bring their carbon footprint down to zero.

However, not all carbon offsets are created equal and ensuring that a carbon offset represents actual greenhouse gas reductions can be a long process. Carbon offsets are still very new. In fact, it's entirely possible that how they offset their emissions a few years from now will be very different from how they do it today. Their offsets may be more personalized, more local and rely on emergent technologies that have a global impact.

X.

Case Study - Carbon Finance in Africa Carbon finance should be a 'win-win' opportunity for Africa and its investors: a way to promote new development initiatives, such as renewable energy projects, while reaping financial benefits and effectively responding to climate change. Indeed, the continent finds itself in a favorable position to benefit from investment opportunities linked to carbon finance. It possesses abundant natural resources suitable for sustainable energy production.

The lack of existing energy infrastructure, particularly in SubSaharan Africa, makes it possible to leapfrog the emission-intensive stage of economic development to clean technologies. So why does Africa make such little use <https://assignbuster.com/carbon-finance-in-africa-and-strategies-employed-by-google/>

of the carbon finance mechanisms on offer for investment in the renewable energy sector? Where are the incentives for change and how can these measures be implemented? We will investigate these questions, beginning with an analysis of available carbon finance instruments as they apply to the African energy sector.

It shows how successful implementation of these mechanisms, particularly the Clean Development Mechanism (CDM) has been impaired by combination of financial and capacity barriers encountered by investors. These barriers range from high start-up costs of project development, to limited funding sources, to high risk perception. Finally, this paper offers concrete recommendations for how African governments and the international community can overcome these barriers and benefit from current carbon financing opportunities.

The recommendations range from increasing the development of human resources and strengthening the role of national and regional regulatory bodies, to identifying new opportunities for South-South technology transfer and harnessing new sources of funding and risk mitigation instruments. Investing in renewable energy and accessing carbon finance is indeed challenging, but the stakes are high and the benefits great. By implementing strategies to overcome barriers, African countries stand to secure significant gains.

Introduction

In an era of climate change and fossil fuel depletion, governments and investors have a common interest in identifying the most efficient and

reliable energy sources to sustain future growth. According to the International Energy Agency, most of the current world energy infrastructure will need to be replaced by 2030 (World Energy Outlook, 2008). In global terms, it is anticipated that annual investments in renewable energy for electricity capacity will exceed those for fossil-fuel power plants in the projection period between 2007 and 2030 (World Energy Outlook, 2008).

Indeed, global investment in renewable power generation, amounting to about USD140 billion, topped investment in fossil fuel technologies for the first time in 2008 (UNEP Global Trends 2009). As renewable energy increases in importance, African governments and the International Community could take measures to boost investment in this area and increase technology transfer for renewable energy development.

Stable energy supply is essential for strong economic growth and poverty reduction. Renewable energy is abundant and diverse and has the advantage of reducing reliance on finite or imported energy resources.

It includes, but is not limited to biomass, solar power, wind power, hydropower, tide power and geothermal power. It can improve energy security, especially for non-oil producing countries, creates employment and helps fight poverty by improving energy accessibility, particularly for remote or rural populations. Furthermore, the market for clean energy technologies is profitable. Currently valued at USD155 billion, (Global Financial Crisis, 2009) it is expected to reach a global market size of USD1.

9 trillion by 2020 (UNEP Finance Initiative CEO Briefing, 2004).

Yet Africa makes little use of carbon finance mechanisms for investment in the renewable energy sector. While the continent is well endowed with renewable energy prospects, only a very small proportion of sources is currently exploited. Analysis of the International Energy Agency's most recent (2007) statistics shows that although renewable energy makes up 16 percent of all Africa's energy sources used for power generation, the vast majority comes from combustible renewables and waste. In addition, less than one percent of the total figure is made up of hydro electricity.

Other forms of renewable energy in the continent (geothermal, solar, tide and wind) are negligible (World Energy Balances, 2009).

Barriers and Recommendations Africa - Context There is a lot of potential in Africa which is currently underexploited. It holds less than 2% of registered CDMs (UNFCCC 2009). It has a potential of 7 GW potential from geothermal alone (UNEP press release, 2008). The sub-Saharan region can house more than 3, 200 CDM projects which could add 170 GW of power (State and Trends, 2009). CDM Projects in Africa

Only 1% of the Congo's 77, 810 km² of water is converted into hydropower while 94% of the population goes without electricity (CIA World Factbook, 2009; World Energy Outlook, 2008). This graph shows that Africa lags behind other regions which may be a good thing because it may then have a higher potential to improve.

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