

Policy paper

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How Rwanda  
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investment from  
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## **Carbon credits where credits are due: how Rwanda can generate green investment from electric mobility offsets**

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**September 2021**

### **Executive Summary**

Rwanda's Ministry of Infrastructure is working with the private sector to scale up electric mobility in Rwanda. Rwanda-based electric motorbike company Ampersand, is seeking to generate carbon offsets from the greenhouse gas reductions that its electric motorbikes will generate compared to combustion engine motorbikes, and received initial supported for this purpose from the Shell Foundation (funder) and South Pole (intermediary entity providing technical support) in 2020 and 2021. This potential opportunity to generate carbon offsets from electric mobility, leading to increased green investment in the sector, led the authors to ask how Rwanda can realise this opportunity, what policy and institutional structures are already in place and what further interventions would be necessary to make e-mobility carbon offsets a reality.

This paper seeks to address these questions, by: i) describing Rwanda's commitment to green growth; ii) giving an overview of global carbon markets; iii) explaining the role of government in maximising the benefits from engaging in carbon markets; iv) describing how Rwanda is already engaging in carbon markets; v) making the case for electric mobility as an early candidate for real carbon credit transactions under Article 6 of the Paris Agreement; and vii) giving reflections on a well-designed carbon market regulation. The core arguments of this paper as follows.

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### **Rwanda is committed to green growth and to participation in carbon markets:**

Green growth<sup>7</sup> is a cornerstone of Rwanda's national development strategies, including Vision 2050,<sup>8</sup> the National Strategy for Transformation 1 (NST 1) that implements it, and a Green Growth and Climate Resilience Strategy from 2011 which is in the process of being updated. Rwanda's commitment to green growth is also demonstrated by the country's ratification of the Kyoto Protocol as a party to the United Nations Framework Convention on Climate Change (UNFCCC) on 22 July 2004, the establishment of Rwanda Environmental Management Authority (REMA) as the Designated National Authority in 2013 for participation in the Clean Development Mechanism (CDM) that was established under the Kyoto Protocol,<sup>9 10</sup> under which the compliance market for carbon credits has been regulated thus far. Rwanda is already beginning to establish institutional capacity to engage in Article 6 of the Paris Agreement which has succeeded the CDM,<sup>11</sup> through the Standardised Crediting Framework, a joint project between Rwanda Environmental Management Authority and the World Bank.

**Government engagement in the carbon credit market tends to increase the value of carbon credits and thus green investment.** The benefit of government intervention in carbon markets is that it significantly increases the value of carbon credits generated in the country, and thus increases green investment. The logic is that well-regulated carbon credits are perceived as having far higher quality and integrity in terms of additionality, and thus attract higher prices in international carbon markets. The overriding reason for government to engage is thus because the sale of carbon credits can bring green investment into the country, supplementing other external sources of green finance. The additional resources brought through sale of carbon credits can both incentivise and pay for carbon abatement in Rwanda, which can count towards the conditional measures listed in the Nationally Determined Contribution and complement existing measures that are planned. In this way, carbon markets can complement Rwanda's green growth strategy.

**Electric mobility is a suitable candidate to be used to pilot some of the first transactions of real carbon credits under Article 6 of the Paris Agreement.** Doing so would build on the knowledge built by the SCF pilot, but going beyond the simulation stage to a real transaction. Whilst the rules of multilateral transactions under Article 6.4 are not yet agreed, it would be possible for Rwanda to trade carbon credits with a bilateral partner under Article 6.2. The reasons for the suitability of e-mobility, which are elaborated further in this paper, can be summarised as follows:

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<sup>7</sup> OECD defines green growth as the process of promoting economic growth while reducing emissions, minimising waste and the inefficient use of resources, and maintaining biodiversity.

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[https://www.minecofin.gov.rw/fileadmin/user\\_upload/Minecofin/Publications/REPORTS/National\\_Development\\_Planning\\_and\\_Research/Vision\\_2050/English-Vision\\_2050\\_Abridged\\_version\\_WEB\\_Final.pdf](https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf)

<sup>9</sup> [https://www.perspectives.cc/fileadmin/user\\_upload/Revitalizing\\_Eastern\\_Africa%E2%80%99s\\_PCG\\_2021.pdf](https://www.perspectives.cc/fileadmin/user_upload/Revitalizing_Eastern_Africa%E2%80%99s_PCG_2021.pdf)

<sup>10</sup> <http://climateportal.rema.gov.rw/sites/default/files/CB1%20crediting%20and%20PA%20overview.pdf>

<sup>11</sup> [https://www.perspectives.cc/fileadmin/user\\_upload/Revitalizing\\_Eastern\\_Africa%E2%80%99s\\_PCG\\_2021.pdf](https://www.perspectives.cc/fileadmin/user_upload/Revitalizing_Eastern_Africa%E2%80%99s_PCG_2021.pdf)

- E-mobility has high development impact and low additionality risk, two criteria specified by the Standardised Crediting Framework project for new sectors to be added to it. Electric mobility has a low risk of failing to be additional: it is clear that reduced fuel imports and a shift to electric power from the grid would indeed be additional, and will thus be easier to accommodate within the expected Article 6 accounting rules.
- The e-mobility sector is ready and has momentum: Companies in the electric motorbike sector are interested and ready to participate in international carbon markets; for example, the emissions reductions of Ampersand motorbikes have already been calculated by South Pole, which can also advise on how MRV requirements can be designed for the e-mobility sector to ensure a faster, lower cost and more accurate verification. Moreover, the e-mobility sector has political momentum: President Paul Kagame stated in 2019 his intention that internal combustion engine motorbike taxis are to be replaced by electric motorbikes,<sup>12</sup> and the Cabinet passed an e-mobility strategy in April 2021.
- The e-mobility sector would benefit from the green investment that generating carbon offsets on the compliance market would bring, and as South Pole has calculated in work conducted for Shell Foundation, this investment could materially affect profit margins.

**To take advantage of carbon markets, the Government of Rwanda will need to establish a regulatory framework by passing a carbon market regulation.** A note on lessons learnt published by the Standardized Crediting Framework project argues that this is the next priority. Attractively designed carbon market regulation can be a powerful tool to attract more green finance, products and practices to accelerate a country's transition towards a green economy. To take advantage of carbon markets, this paper recommends that the Government of Rwanda establishes a regulatory framework to achieve the following:

- Provide explicit guidance to investors/project owners about the project types and sectors that are permitted to generate carbon credits
- Provide assurance regarding carbon credit ownership and carbon credit sharing
- Establish accounting framework and procedures to facilitate the digital accounting of GHG emissions
- Clarify tax policy on carbon credits

The Government of Rwanda need not wait for the remaining issues relating to Article 6.4 of the Paris Agreement, which regulates multilateral carbon markets, to be addressed to pass a carbon market regulation, because Rwanda can still trade through bilateral agreements on carbon markets with specific countries, under Article 6.2.

Regardless of the sector selected to generate carbon offsets under Article 6, the process of making these carbon credits “official” will require resources and technical assistance; however, in the long term, investment in a strong framework will reduce barriers and transaction costs for future carbon projects and scale decarbonisation

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<sup>12</sup> <https://www.voanews.com/africa/rwanda-encourages-youth-use-electric-motorcycles>

efforts, and will help Rwanda to meet its green growth goals through increased green investment. There will also be political benefit because few countries have started the process of generating carbon offsets (sold bilaterally) under Article 6 of the Paris Agreement, and Rwanda would be one of the first to do so.

## **Rwanda's commitment to green growth**

Green growth is a cornerstone of Rwanda's national development strategies, including Vision 2050,<sup>13</sup> the National Strategy for Transformation 1 (NST 1) that implements it, and a Green Growth and Climate Resilience Strategy from 2011 which is in the process of being updated. Rwanda's commitment to green growth is also demonstrated by the country's ratification of the Kyoto Protocol as a party to the United Nations Framework Convention on Climate Change (UNFCCC) on 22 July 2004, the establishment of Rwanda Environmental Management Authority (REMA) as the Designated National Authority in 2013 for participation in the Clean Development Mechanism (CDM) that was established under the Kyoto Protocol,<sup>14 15</sup> and Rwanda's readiness to establish institutional capacity to engage in Article 6 of the Paris Agreement which will succeed the CDM.<sup>16</sup>

Rwanda was the first country in Africa to submit a revised Nationally Determined Contribution (NDC) to the United Nations in May 2020, and one of just 44 countries globally to submit by the UNFCCC deadline of the end of 2020. Rwanda's second NDC presents a list of mitigation and adaptation measures to be implemented by 2030 and to be funded by unconditional (government) and conditional (conditional on private sector and external funding) sources, costing an ambitious total of 11 billion USD. The report<sup>17</sup> estimates a total emissions reduction potential of nearly 4.6 million tonnes of carbon dioxide in 2030, and an additional reduction of 2.7 million tonnes of carbon dioxide conditional on international support. Priority mitigation measures for emissions reductions are specified in water management, grid hydropower, solar mini-grid and sustainable charcoal production and consumption. Unconditional mitigation measures for emissions reduction in the transport sector include tax incentives to improve vehicle emissions standards and scrapping of old vehicles. Conditional mitigation measures largely relate to public transport infrastructure such as electric vehicle programmes, bus systems and non-motorised transport.

The 2020 NDC update states that "Rwanda intends to meet its conditional contribution through the use of climate finance and international market mechanisms where appropriate, building upon the experience of the Clean Development Mechanism (CDM) and other existing market mechanisms". This clearly sets out the government's

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[https://www.minecofin.gov.rw/fileadmin/user\\_upload/Minecofin/Publications/REPORTS/National\\_Development\\_Planning\\_and\\_Research/Vision\\_2050/English-Vision\\_2050\\_Abridged\\_version\\_WEB\\_Final.pdf](https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf)

<sup>14</sup> [https://www.perspectives.cc/fileadmin/user\\_upload/Revitalizing\\_Eastern\\_Africa%E2%80%99s\\_PCG\\_2021.pdf](https://www.perspectives.cc/fileadmin/user_upload/Revitalizing_Eastern_Africa%E2%80%99s_PCG_2021.pdf)

<sup>15</sup> <http://climateportal.rema.gov.rw/sites/default/files/CB1%20crediting%20and%20PA%20overview.pdf>

<sup>16</sup> [https://www.perspectives.cc/fileadmin/user\\_upload/Revitalizing\\_Eastern\\_Africa%E2%80%99s\\_PCG\\_2021.pdf](https://www.perspectives.cc/fileadmin/user_upload/Revitalizing_Eastern_Africa%E2%80%99s_PCG_2021.pdf)

<sup>17</sup> [https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Rwanda%20First/Rwanda\\_Updated\\_NDC\\_May\\_2020.pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Rwanda%20First/Rwanda_Updated_NDC_May_2020.pdf)

intention to explore international carbon market mechanisms. In the following sections we explore what carbon markets are, why Rwanda should get involved and what Rwanda is already doing on carbon markets; we then reflect on next steps and make the case for electric mobility.

## What are carbon markets?

**Countries and companies can bring in green investment by generating and selling carbon credits in international carbon markets.** So what are carbon markets and how can Rwanda take advantage of them?

Carbon markets are mechanisms for the trading of carbon credits among countries and corporations. They are just one type of “climate market” that exists among many (for example, renewable energy certificates),<sup>18</sup> <sup>19</sup> although a very important one. A **carbon credit** is a permit allowing its owner to emit one tonne of carbon or an equivalent of another greenhouse gas (GHG).<sup>20</sup> Countries or corporations trade carbon credits on two different types of carbon markets: **compliance markets** and **voluntary markets**.

**Compliance markets** are set up when countries or corporations must adhere to international and domestic environmental regulations; compliance markets often come in two main forms: **baseline-and-credit schemes**, which deal with carbon credits called **offsets**, and **emissions trading schemes**, often known as “cap-and-trade” schemes, which deal with carbon credits known as **allowances**.

Baseline-and-credit schemes, or project-based systems, facilitate the purchase of carbon offsets to meet emissions regulations. Firms seeking to offset their carbon emissions and meet GHG reduction regulations (or be net zero emitters) can purchase emission reduction credits - offsets - generated through projects at facilities not covered by the cap. This is where Rwanda can benefit: through projects that reduce emissions, it can generate carbon offsets that can be sold to firms in baseline-and-credit schemes. Carbon offset buyers can only legitimate a claim to emission reductions if those reductions come from a project that would not have happened anyway (additionality).

Under emissions trading schemes, governments or supranational entities (for example, the European Union)<sup>21</sup> allocate or auction carbon credits - known as

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<sup>18</sup> <https://www.investopedia.com/terms/r/rec.asp>

<sup>19</sup> Dargusch, P. & Griffiths, Andrew. (2008). Introduction to special issue: A typology of environmental markets. *Australasian Journal of Environmental Management*. 15. 10.1080/14486563.2008.9725186.

<sup>20</sup> ClimateCare 'An Introduction to Carbon Markets:

[https://www.ieta.org/resources/Aviation/IETA%20IATA%20Workshops/Nairobi/What%20is%20a%20carbon%20credit%20-%20ClimateCare%20\(NBO\).pdf](https://www.ieta.org/resources/Aviation/IETA%20IATA%20Workshops/Nairobi/What%20is%20a%20carbon%20credit%20-%20ClimateCare%20(NBO).pdf)

<sup>21</sup> International examples of cap-and-trade schemes include the Regional Greenhouse Gas Initiative (RGGI) in the United States which set GHG emissions requirements in the power sector for 11 states, under which entities have flexibility in trading carbon credits in energy efficiency and renewable energy investments. The European Union Emissions Trading Scheme (EU ETS) is a regional compliance market serving the entire continent and other countries and covers approximately 40% of Europe’s GHG emissions.(source:

[https://ec.europa.eu/clima/policies/ets\\_en](https://ec.europa.eu/clima/policies/ets_en)) The EU ETS limits emissions within the power, manufacturing and

**allowances** - to entities that are designated to be liable for their emissions. Those entities can then trade those allowances amongst others under the cap-and-trade system. Once these allowances have been allocated or auctioned at the start, no further allowances are added (they are capped); they are then traded, and the goal is to internalise the cost of emissions.<sup>22</sup> We mention emissions trading schemes here for completeness, because they are a very important compliance mechanism, but the carbon credits - allowances - that they generate, cannot be traded outside the scheme, and thus, for example, Rwanda cannot generate and sell allowances, only offsets (unless it becomes part of an emissions trading scheme).

However, regulators of the cap-and-trade schemes sometimes allow offsets to be traded in emissions trading schemes. This represents a de-facto increase in the number of available allowances and therefore raises the cap on emissions, while geographically shifting where the emission reductions occur.<sup>23</sup>

International compliance markets were originally developed under the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC secretariat was established in 1994 to coordinate and promote global cooperation<sup>24</sup> in the reduction of GHG emissions. In 1997, the Kyoto Protocol to the UNFCCC was convened to develop legally binding targets for industrialized countries (known as Annex B - formerly Annex 1 - countries) to reduce GHG emissions to below 5% their (1990 levels) average through carbon market instruments.

Article 12 of the Kyoto Protocol established the Clean Development Mechanism (CDM) which is the framework that has governed international compliance markets for offsets. Under the Protocol, Annex B countries with emission-reduction commitments are required to implement emission-reduction projects in LDCs which would otherwise not have been implemented.<sup>25 26</sup>

The second commitment period of the CDM came to an end in December 2020, temporary measures have been applied until November 2021<sup>27</sup> and may be applied

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airline sectors. By setting a cap-and-trade scheme, the EU ETS limits the total number of allowances available to maintain value and facilitates efficiency in attaining reduction targets as well as fostering economic activity in the region. China also launched an ambitious new national emissions trading scheme in 2021 (source: <https://www.forbes.com/sites/scottcarpenter/2021/03/02/toothless-at-first-chinas-carbon-market-could-be-fearsome/?sh=24f98492af10>)

<sup>22</sup> Well-functioning, competitive carbon markets can minimise the cost of reducing emissions at an industry or country level, because entities that find reducing emissions too expensive will buy allowances from entities that can reduce emissions more cheaply - or in the language of economics - have a lower marginal abatement cost. Those who can abate carbon the most cheaply can compete the price of carbon credits down.

<sup>23</sup> <https://web.archive.org/web/20171005153958/http://www.c2es.org/docUploads/climate101-captrade.pdf>

<sup>24</sup> <https://unfccc.int/about-us/about-the-secretariat>

<sup>25</sup> <https://unfccc.int/process-and-meetings/the-kyoto-protocol/mechanisms-under-the-kyoto-protocol/the-clean-development-mechanism>

<sup>26</sup> These projects are designed by project participants, approved by a Designated Operational Entity under the Protocol, and audited by the CDM Executive Board of the UNFCCC. Successful projects in carbon sequestration and/or carbon reductions are then issued carbon credits which may be traded on the global market. Both developed and developing countries can offset and/or neutralise GHG emissions without compromising economic growth and sustainability.

<sup>27</sup> <https://unfccc.int/news/the-cdm-executive-board-agrees-on-temporary-measures-to-address-cop26-postponement>

indefinitely<sup>28</sup>, and focus has now shifted largely to the Paris Agreement which is intended to supersede the Kyoto Protocol. Within this, CDM is intended to be superseded by the Sustainable Development Mechanism under Article 6 in the Paris Agreement of 2016.<sup>29</sup>

Within Article 6 of the Paris Agreement there are two important Articles: 6.2 and 6.4. Article 6.2 provides a basis for countries to exchange carbon credits (referred to as “internationally transferred mitigation outcomes” (ITMOs) in the compliance market bilaterally and voluntarily, and this can be operationalised without further rules being agreed internationally. This means that Rwanda can trade in offsets in compliance markets with other countries, bilaterally, under Article 6.2 of the Paris Agreement.

Article 6.4, provides for a mechanism to supersede the CDM; however, to become operational this requires additional rules to be agreed by the Conference of the Parties (COP), the body that governs the UNFCCC and meets annually. Since 2016, the various COP meetings have failed to resolve differences; however, the next meeting will be COP26 in Glasgow in November 2021 and whilst there is uncertainty around the future of both CDM and a new Sustainable Development Mechanism, there is hope that the issues around Article 6.4 can be resolved.<sup>30</sup> Resolving them would enable Rwanda to trade offsets in compliance markets not only in bilateral agreements with specific countries as under Article 6.2 but also with all countries that are parties to the UNFCCC that are selling offsets on compliance markets.

Operating in parallel to compliance markets, the **Voluntary Carbon Market (VCM)** is increasingly relevant. In the VCM, countries and corporations that wish to reduce their GHG emissions can buy carbon credits known as **Voluntary Emission Reduction (VER)** units, and in the process, finance climate action projects that would not otherwise be implemented, while producing additional benefits such as job creation, public health improvements, pollution prevention and biodiversity protection. As such, voluntary carbon credits are innovative and cost-efficient (in the short-term) tools for financing projects that avoid carbon emissions and projects that reduce carbon emissions worldwide, while stimulating sustainable economic growth.

Driven by the market dynamics of demand and supply, VCM activities are based on the issuance and retirement of carbon credits verified by international standards such as the **Gold Standard** and the **Voluntary Carbon Standard**. Entities involved in climate action projects may claim impact (either carbon emissions reduction, removal

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<sup>28</sup> <https://climatefocus.com/sites/default/files/Post-2020%20CDM%20QA%20Briefing%20Note.pdf>

<sup>29</sup> <https://sdg.iisd.org/commentary/policy-briefs/delivering-climate-ambition-through-market-mechanisms-capitalizing-on-article-6-piloting-activities/>

<sup>30</sup> In COP meetings so far, countries have been unable to agree on several important issues: Farand (2019, source <https://www.climatechangenews.com/2019/12/02/article-6-issue-climate-negotiators-cannot-agree/> ) states that Brazil, China and India would like to trade their surplus of credits from the previous CDM regime on the new market set-up under the Paris Agreement, but analysts have warned that this would flood the market with credits of low value; negotiations have also stalled on issues relating to double counting and ways to ensure overall mitigation. COP25 in 2019 failed to resolve Article 6, which will thus be a major agenda item at the upcoming COP26 in Glasgow in 2021.



or avoidance) after the generated voluntary carbon credits have been issued by a standard and retired in the appropriate registry.

VCMs are probably the way forward for global carbon markets for three reasons:

- First, in spite of being “voluntary”, VCM can deliver substantial emission reductions effectively. As of 2020, over 70 countries and 1,000 corporations have pledged net-zero emissions by 2050 with the former enhancing international pledges under the Paris Agreement. The VCM provides cost-effective solutions to translate these pledges into climate action in efforts to reduce global warming to below 2 degrees celsius. In 2020, former Bank of England Governor Mark Carney, who serves as UN Special Envoy for Climate Action, launched a global taskforce to begin scaling up voluntary carbon markets - the goal is to scale them up fifteen fold.<sup>31</sup>
- Second, VCM is large and growing: it is largely responsible for the recent surge in global carbon market trading, with a record high in 2019 in which 138 million tonnes of carbon dioxide equivalents were issued to, and 70 million carbon credits were bought, by participating entities.<sup>32</sup>
- Third, as mentioned, the VCM is not dependent on the success of the Paris Agreement or COP 26, and can continue to run in parallel with compliance markets even if issues with Article 6.4 remain unresolved.

However, for the transport sector, including the electric mobility sector, the price of carbon offsets on voluntary markets may not be high enough to cover the cost of generating the offsets. Indeed, the higher prices of carbon offsets gained on compliance markets mean that in spite of the general importance of voluntary carbon markets, **compliance markets are a better option on which to sell electric mobility carbon offsets.**

The way that Rwanda and most developing countries can take advantage of carbon markets is through carbon offsetting as noted. This can work both through compliance markets and voluntary markets.

Carbon offsetting involves six entities as shown in Figure 2, numbered here for clarity: i) the carbon abating entity is the entity in Rwanda that implements a project that reduces carbon emissions - for example the electric motorbike company Ampersand launches new electric motorbike taxis that displace combustion engine motorbikes. The extent to which the carbon abating entity has reduced emissions is monitored and reported by ii) an intermediary entity - for example the company South Pole in the Ampersand case. iii) An accredited verifying entity verifies the carbon standard has been met, and iv) the carbon standard would then approve and issue carbon credits. Then, the carbon abating entity would sell the carbon credits to v) a carbon credit buyer, receiving funds from the transaction. The vi) Government of Rwanda's

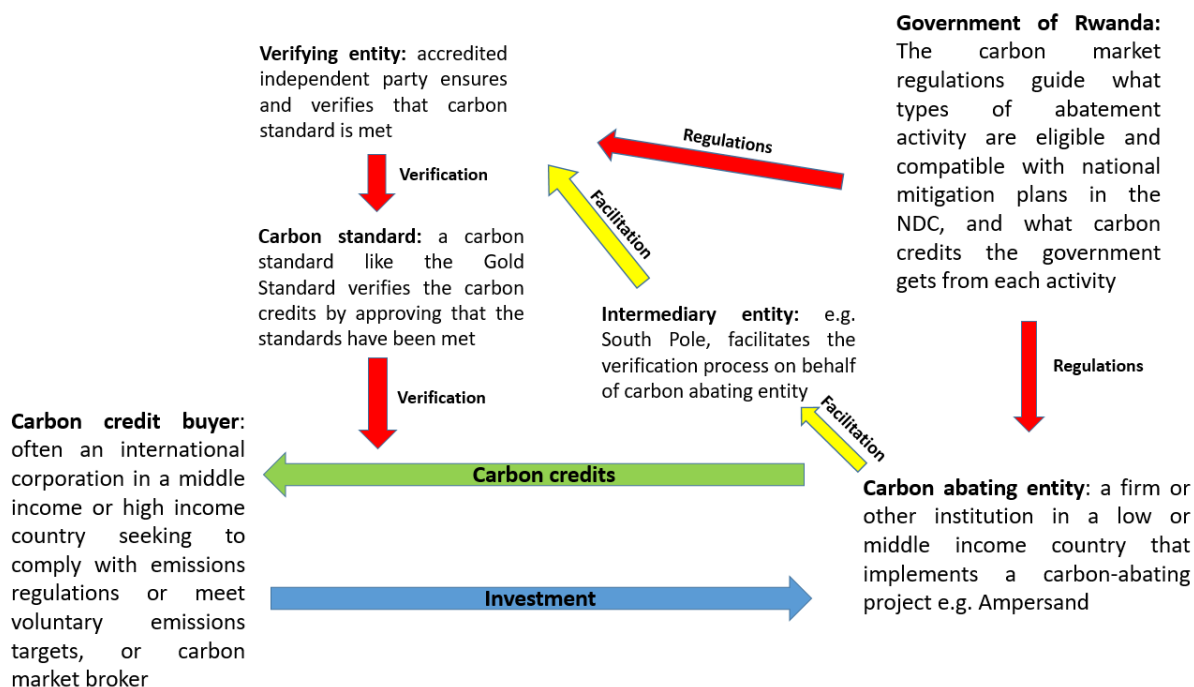
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<sup>31</sup> [BOE's Carney Launches Global Taskforce to Boost Voluntary Carbon - Ecosystem Marketplace](#)

<sup>32</sup> <https://www.mckinsey.com/business-functions/sustainability/our-insights/how-the-voluntary-carbon-market-can-help-address-climate-change>

regulations cover what activity the carbon abating entity is allowed to base the carbon credits on. It is possible that in an Article 6 transaction on the compliance market, the Government would also receive an appropriate proportion of the carbon credits generated.

Figure 1: The six entities involved in carbon offsetting



## The benefits of government engagement with carbon markets

The Government of Rwanda is already engaging with carbon markets regulation; however this section reiterates the main benefits of doing so for readers unfamiliar with carbon markets. The overriding reason to engage is that **the sale of carbon credits can bring green investment into the country, supplementing other external sources of green finance**. The additional resources brought through sale of carbon credits can both incentivise and pay for carbon abatement in Rwanda, which can count towards the conditional measures listed in the Nationally Determined Contribution and complement existing measures that are planned. In this way, carbon markets can complement Rwanda's green growth strategy.

In general terms, government involvement is warranted - in the form of a regulatory framework clearly defining which activities are eligible for internationally tradable carbon credits - for one main reason: clear regulation would increase the dollar value of each carbon credit that a country receives. The current global carbon market is fragmented with prices ranging from 0.10 USD to - in rare cases - over 30 USD/ton of carbon. This diverse price range is the result of prevailing uncertainty related to the allowed use of a carbon credit as well as the demand/supply balance within the different carbon credit use cases.

The lowest prices are paid for carbon credits from projects and jurisdictions that are:

- excluded from use within the most relevant/high volume carbon markets;

- seen of questionable integrity and are at risk of creating negative reputational impacts for their buyers (non-additional, avoidance of hydrofluorocarbon) for use within the voluntary carbon market; or
- at high risk of being double counted or double claimed because of unclear accounting governance.

The highest prices are paid for carbon credits from projects and jurisdictions that are:

- permitted as compliance instruments in key carbon markets;
- seen as having high integrity, quantifiable co-benefits related to other (non-climate) SDG, contribute to future cost reductions of technologies that aim to reduce hard-to-avoid emissions (technology removals) for use within the voluntary carbon market; and/or
- are originated and accounted for clearly without any double counting/claiming risks.

The Government of Rwanda can thus have substantial influence over the value of carbon credits originated within Rwanda by providing clear guidance and regulation that makes them eligible for use within key international carbon markets, elevates their integrity, and eliminates double counting and double claiming.

The consequences of a proactive and positive carbon credit regulation are expected to be a substantially larger inflow of green capital which generates a return in carbon credits as well as associated co-benefits. Independent studies show that the economic benefits per 1 ton of carbon credit amount to > 100 USD/ton of carbon credit when taking co-benefits into account.<sup>33</sup> A clear carbon credit regulation could cause a 5 to 10 X increase in the value of carbon credits bought from Rwanda, from 2-3 USD/ton to 10-30 USD/ton of carbon credit. The government could also benefit by “taxing” some portion of the carbon credits, and indirectly through additional tax revenue generated from increased green investment, for example.

Clearly, the increase in value due to clear regulation far exceeds the percentage of carbon credits that could be “taxed” away by the government. For example, if government regulation increases the value of a carbon credit from 3 dollars to 15 dollars, but the government takes 20% of the carbon credits generated by a project, the carbon abating entity would still experience a fourfold increase in value received, from 3 dollars to 12 dollars.

## **How is Rwanda already engaging with carbon markets?**

Rwanda has been engaging with the CDM for some years: in 2005, the government established the Designated National Authority (DNA) and assigned Rwanda Environmental Management Authority to this role upon its creation in 2006. As the DNA, REMA was also given responsibility to coordinate voluntary carbon market projects. Table 1 shows all CDM Programmes of Activities that were ever under the UNFCCC categories of “registered” or “validation” in Rwanda. Of particular relevance to this paper is the “Multi-country Programme of Activities: Electric Mobility in Africa

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<sup>33</sup> <https://www.icroa.org/Offsets>

and Asia” which was submitted for validation in September 2020, and covers all countries in East Africa including Rwanda.

*Table 1: Registered or Validated CDM Programme of Activities (PoA) projects for Rwanda*

<b>Project</b>	<b>Date registered</b>	<b>Coordinating/managing entity</b>
Improved cookstove programme for climate & community impact by SDG 13 Ventures	03 Dec 20	SDG 13 Ventures Pte Ltd
Safe Drinking Water Programme in Least Developed Countries	2020*	Advanced Carbon Asset Management Co., Ltd
Multi-country Programme of Activities: Electric Mobility in Africa and Asia	2020*	atmosfair gGmbH
Sustainable Fuelwood and Microgasification Cooking Solutions for rural and urban Households	31 May 18	Inyenyeri Social Benefit Company, FPC
Gigawatt Global Programme of Activities	23 Oct 15	Gigawatt Global Cooperatief U.A.
Renewable Energy CDM Programme of Rwanda (RECPR)	30 Mar 15	DG Works Ltd
Impact Carbon Global Safe Water Programme of Activities	01 May 14	Impact Carbon
DelAgua Public Health Program in Eastern Africa	21 Nov 13	DelAgua Health Rwanda Limited
Paradigm Sub Saharan Africa Cook Stove Programme	01 Jul 13	The Paradigm Project
Heat Retention Cooking in Less Developed Countries	18 Mar 13	Natural Balance International Ltd (NBI)
Efficient Cook Stove Programme: Rwanda	29 Jan 13	CZRWA Ltd
African Clean Energy Switch – Biogas (ACES-Biogas)	24 Dec 12	African Clean Energy Switch - Biogas (ACES-Biogas) Limited
East Africa Renewable Energy Programme (EA-REP)	19 Dec 12	Standard Bank Plc
PoA for the Reduction of emission from non-renewable fuel from cooking at household level	30 Nov 12	Green Development AS
Improved Cook Stoves programme for Rwanda	31 Aug 12	atmosfair gGmbH
Improved Cook Stoves for East Africa (ICSEA)	17 Aug 12	Improved Cook Stoves for East Africa (ICSEA) Limited
Sustainable Promotion of East African Renewables (SPEAR)	2012*	Sustainable Promotion of East African Renewables (SPEAR) Limited
For Stoves Programme of Activities	2012*	CME For Stoves Ltd
Energy Efficient Commercial Lighting Programme of Activities South Africa, Botswana and Rwanda	2011*	Standard Bank of South Africa Ltd
International water purification programme	2011*	PureWater
Project to replace fossil fuel based lighting with Solar LED lamps in East Africa	2011*	Tough Stuff International

\*Starred projects in process of validation - “last period for comments for validation” on UNCCC web site

In addition to these projects, Rwanda has adopted a pilot of the Standardized Crediting Framework (SCF), an approach brought by the Carbon Initiative for Development (Ci-Dev) and pioneered in Senegal, followed by Rwanda. The goal of SCF is to help

countries to transition from the CDM to the new regulatory framework of the Paris Agreement, and facilitate the transition of the project pipeline under the CDM to the new regulatory framework. Rwanda already has an institutional framework set up under REMA to regulate CDM carbon market transactions, and the SCF has worked in Rwanda since 2018 to adapt that framework.

The Rwanda SCF pilot focused on improved cookstoves and built on the Inyenyeri programme. The pilot is a simulation in which no real carbon credits are issued or traded, but has allowed Rwanda to gain experience in potential approaches to carbon and climate finance whilst the rules of these mechanisms under the Paris Agreement are being finalised. Another goal of SCF has been to make the process of issuing carbon credits more efficient than the traditional CDM route with lower transaction costs - according to the SCF Rwanda Pilot Lessons Learned Note, “the SCF process saved several years of process time in comparison to the CDM process, and even for new programs under the SCF it would be unlikely the program preparation would take more than six months. Just in the phases up to registration/listing, the cost savings were more than \$180,000 for one program”.<sup>34</sup>

The Lessons Learned Note contains the following recommendation for expanding SCF to other sectors in Rwanda:

*“To leverage the SCF infrastructure developed for the pilot, expanding into other sectors within Rwanda could also both increase impact and generate important experience...Focusing on technology areas with low additionality risks will reduce the methodologic complexity of the system while maintaining a high level of credibility. Rwanda may want to focus on sectors and technologies with high development impacts, and not simply those with the greatest mitigation potential. Mitigation activities with clear impacts on the national GHG inventory will also be easier to accommodate within the expected Article 6 accounting rules.”<sup>35</sup>*

Rwanda does not yet have a system in place to regulate the issuance and trade of carbon credits, or internationally transferred mitigation outcomes (ITMOs), the Article 6 term for carbon credits. So the Lessons Learned Note recommends that “a near term priority should be to begin to plan how international [carbon credit] transfers might be authorized by the Rwandan government, and whether this may require the adaptation of the SCF governance structures or institutional arrangements”.<sup>36</sup> Finally, the note states that SCF is just the starting point, and additional resources will be necessary to build the long term institutional capacity for Rwanda to successfully generate carbon credits and to become an early success story on the continent in relation to selling carbon credits under the Paris Agreement. The note contains several other important recommendations for SCF, but our focus here is now how to incorporate electric mobility.

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<sup>34</sup> Spalding-Fecher, R., Greiner, S., Krämer, N., Mongendre, L., Ntazinda J., (2020) “Piloting a Standardized Crediting Framework for Scaling Up Energy Access Programs, Lessons Learned Note, Rwanda Pilot, Final Report 21/02/2020”, Carbon Limits A/S, Climate Focus, and Climate Concern, World Bank and Rwanda Environmental Management Authority, p. iv

<sup>35</sup> Ibid., p27

<sup>36</sup> Ibid., p5

## **The case for electric mobility as an early candidate for real carbon credit transactions**

The central contention of this paper is that **electric mobility is a suitable candidate to be used to pilot some of the first transactions of real carbon credits under Article 6 of the Paris Agreement**, building on the knowledge built by the SCF pilot, but going beyond the simulation stage to a real transaction. Whilst the rules of multilateral transactions under Article 6.4 are not yet agreed, it would be possible for Rwanda to trade carbon credits with a bilateral partner under Article 6.2.

**E-mobility meets the criteria outlined in the SCF Lessons Learned Note:** As noted above, the recommendation of the Lessons Learned Note is for Rwanda to focus on sectors and technologies with high development impacts, low additionality risks and not simply those with the greatest mitigation potential. Electric mobility meets these criteria. Scaling up electric motorbikes would be a relatively small contribution to emission reductions (at least those creditable for carbon finance), but have a transformational impact on the energy-transport system as a whole. Electric motorbikes would also be likely to reduce future air pollution levels quite significantly, with a range of associated health benefits. There would also be considerable international political benefit to Rwanda being an e-mobility pioneer. Electric mobility has a low risk of failing to be additional: it is clear that reduced fuel imports and a shift to electric power from the grid would indeed be additional, and will thus be easier to accommodate within the expected Article 6 accounting rules.

**The e-mobility sector is ready and has momentum:** Companies in the electric motorbike sector are interested and ready to participate in international carbon markets; for example, the emissions reductions of Ampersand motorbikes have already been calculated by South Pole, which can also advise on how MRV requirements can be designed for the e-mobility sector to ensure a faster, lower cost and more accurate verification. Moreover, the sector would benefit from the green investment that generating carbon offsets would bring, and as South Pole has calculated in work conducted for Shell Foundation, this investment could materially affect profit margins. Finally, the e-mobility sector has political momentum: President Paul Kagame stated in 2019 his intention that internal combustion engine motorbike taxis are to be replaced by electric motorbikes,<sup>37</sup> and the Cabinet passed an e-mobility strategy in April 2021.

**This process would require resources and technical assistance** and a key question is who pays for this. As SCF noted, the next steps will require TA grants for capacity building and project development. Financing all of this will be a challenge and the process might be complex. As mentioned in the Lessons Learned Note, the Rwanda emission reduction goals are entirely conditional upon “availability of international support for finance, technology and capacity building”. Rwanda and its partners should explore other financing sources, which might include some form of “share of proceeds” as well as external donor support. In the long term, investment in a strong framework will reduce barriers and transaction costs for future carbon projects and scale decarbonisation efforts, and will help Rwanda to meet its green growth goals through increased green investment.

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<sup>37</sup> <https://www.voanews.com/africa/rwanda-encourages-youth-use-electric-motorcycles>

## Reflections on a well-designed carbon market regulatory framework in Rwanda in light of the SCF

To take advantage of carbon markets, the Government of Rwanda will need to establish a regulatory framework by passing a carbon market regulation, which the SCF Lessons Learnt Note argues is the next priority. Box 1 provides tangible examples of provisions that such a regulation might contain. This regulation should achieve the following:

- **Provide explicit guidance to investors/project owners about the project types and sectors that are permitted to generate carbon credits:** The regulation should provide explicit guidance to investors/project owners about the project types & sectors that are permitted to generate carbon credits. This guidance is aligned with national development policy and country NDCs, and would include the projects listed in Table 1, for example. This guidance will direct green investment and eliminate uncertainty especially about double-counting (meaning counted once by the country of origin when reporting in its emissions inventory, and again by the receiving country when justifying emissions above its pledged climate effort<sup>38</sup>). Rwanda has already incorporated this approach into SCF by creating a “positive list” of eligible activities that satisfy the additionality requirement; it will be important that e-mobility is also placed on this list.

### Box 1: Examples of provisions in a carbon market regulatory framework

- A country identifies the project types and sectors that are eligible for carbon credit generation. This selection is aligned with the country’s green development priorities and NDC.
- Utility-scale solar PV projects with a capacity above 5 MW are obliged to share 50% of carbon credits with the county (as large-scale solar is competitive to other power generation sources in many jurisdictions).
- E-mobility projects (two wheelers with swappable batteries) are obliged to share 0% of carbon credits until 2025 and 20% of carbon credits between 2026 and 2030) as the initial years are at a high risk of loss making and thus require income from the sale of carbon credits as a means to de-risk the investment.

- **Provide assurance to investors/project owners regarding carbon credit ownership and carbon credit sharing:** The regulation needs to set out specific rules and procedures to clarify the legal ownership of carbon credits from eligible project types. These procedures can include rules for the sharing of carbon credits<sup>39</sup>, i.e. to ensure these projects also contribute (in part) to a country’s NDC, although this is based on the requirement to conduct a corresponding adjustment under Article 6, to avoid double counting.

<sup>38</sup> <https://www.edf.org/sites/default/files/documents/double-counting-handbook.pdf>

<sup>39</sup> Sharing could mean that a mandated amount/share must be sold to (or transferred free of cost) to a national NDC fund.

These sharing rules could be differentiated, taking into account whether a project benefits from public support (i.e. a feed in tariff for renewable energy) or whether the project is considered to represent the “low hanging fruit” ( low cost emission reduction technology). These rules are not yet incorporated into the existing SCF.

- **Establish procedures to facilitate the digital accounting of GHG emissions, to avoid double counting:** The Government would need to establish a national GHG registry system, or participate in a regional GHG Registry System (including registry for carbon credits) if one is set up, to facilitate the digital accounting of GHG emissions and emission reductions for the purposes of their UNFCCC reporting obligations as well as the accounting requirements of carbon markets it participates in (for example, Paris Agreement, Carbon Offsetting and Reduction Scheme for International Aviation, voluntary carbon markets). It clarifies *a priori* its regulations and procedures to carry out international transfers and corresponding adjustments. This system is not incorporated into the existing SCF.
- **Clarify tax policy on carbon credits:** The Government should also clarify the treatment of carbon credits for tax (VAT, export) purposes. This is to enable sound local appraisals of project ideas and inform project bankability, resulting in issuance of carbon credits and financial gains.

To regulate carbon markets, the Government will need to build the technical capacity of decision-makers in regulatory bodies and relevant agencies, to enable informed interpretation and pursuit of carbon market opportunities, and subsequent implementation of national climate change mitigation and adaptation actions.

**Table 2: Conditional NDC mitigation measures that may be eligible for carbon offsetting**

Conditional measure in Rwanda’s NDC	Amount needed (million USD)
Electric vehicle scale up	900
Off grid and rooftop solar electrification	600
Solar mini grids	206
Promotion of on-farm biogas for energy	62
Solar water heater programme	60
Public transport	50

Source: Adapted by the authors from Republic of Rwanda, (2020). “Updated Nationally Determined Contribution.”,



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